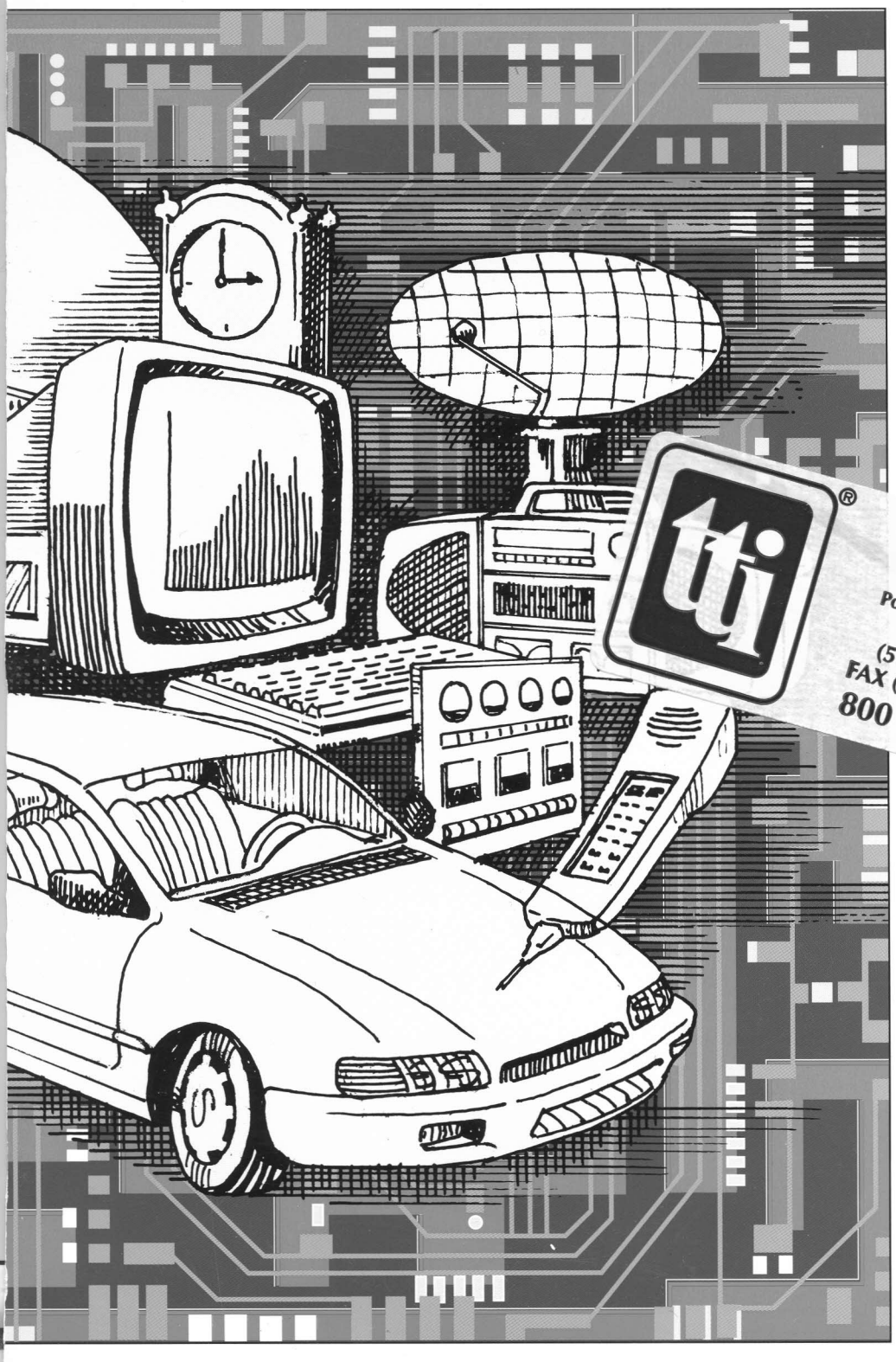
muRata®



SHORT FORM CATALOG

CATALOG NO. G-01-C

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1868 Sources Blvd.
Suite 318
Pointe Claire, Quebec
H9R 5R2
(514) 426-1212
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Murata Electronics
North America, Inc.

This catalog illustrates the vast array of electronic components manufactured and distributed by Murata Electronics North America, Inc. With manufacturing facilities located in Rockmart, Georgia and State College, Pennsylvania, Murata is obtaining worldwide recognition for its development and production of highly reliable electronic components. The Company's advanced design engineering and manufacturing technology, combined with automated production and instrumentation systems, provides a high degree of excellence in product quality. The reliability of these components is illustrated by approvals to UL, CSA and Military specifications.

Murata is one of the world's largest manufacturers of fixed and variable ceramic capacitors and also offers a complete line of other electronic components including potentiometers, piezo alarms, resistor networks, posistors, piezoelectric ceramic filters and resonators, crystal filters and oscillators, EMI/RFI filters, high voltage components and hybrid circuits.

Authorized Distributors
Many of the products found in this catalog are available from authorized Murata distributors. This local availability assures the fastest possible delivery and is supported by the Murata distribution centers in Georgia and the Northeast.

Application Assistance
Murata maintains an experienced staff of application engineers at all of its facilities, who are available to provide any technical support that might be required relative to Murata products.

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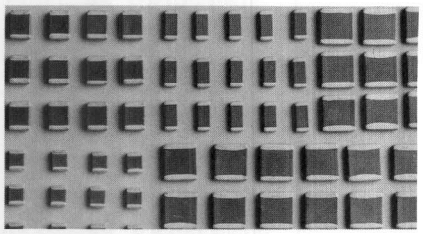
CHIPS, MONOLITHIC CERAMIC CAPACITORS



FEATURES

- **Miniature size**
- **Wide capacitance, T.C., voltage and tolerance range**
- **Industry standard sizes**
- **8 mm and 12 mm tape & reel for auto-placement**
- **Nickel barrier termination standard – highly resistant to metal migration.**
- **Largest production volume and capacity in the industry**

PART NUMBERING SYSTEM

GRM 40 --- X7R 103 K 050 A D

CAPACITOR TYPE AND SIZE See below and following pages.

3-digit code appears as necessary to indicate special thickness requirements. Please consult your local sales office for details.

TEMPERATURE CHARACTERISTICS
Standard TC's (described herein)
C0G=0, ±30ppm (Notes 1 & 2)
X7R=±15%
Z5U=+22, −56%
Y5V=+22, −82%
(See Note 2 below)
P2H=N150±60ppm
R2H=N220±60ppm
S2H=N330±60ppm
T2H=N470±60ppm
U2J=N750±120ppm

NOTE 1: T.C. Tolerance (COG)

Capacitance (pF)	T.C. Tolerance (ppm)
10 or over	± 30 (G)
4.0-9.9	± 60 (H)
2.1-3.9	±120 (J)
.4-2.0	±250 (K)

NOTE 2: Refer to EIA-RS198 for limitations

CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

CAPACITANCE TOLERANCE (Note 2)
COG: (10pF or less)
B=±.1pF
★C=±.25pF
★D=±.5pF
F=±1pF for 10pF only (over 10pF)
F=±1%
G=±2%
★J=±5%
★K=±10%
★X7R:K=±10%
★M=±20%
J=±5% on special request
★Z5U:M=±20%
★Z=+80, −20%
★Y5V:Z=+80, −20%

VOLTAGE
Identified by a three-digit number. 500V available upon request.

MARKING
★A=Unmarked
★B=EIA Marking
C=Non-standard

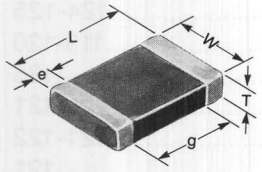
PACKAGING

Reel Diameter	EIA-481-A
★7″ Paper	D
★7″ Plastic	L
13″ Paper	J
13″ Plastic	K
Bulk	B

T/R per EIA-481-1

★ Available as standard through authorized Murata Erie Distributors.

CHIP DIMENSIONS

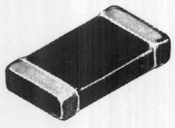


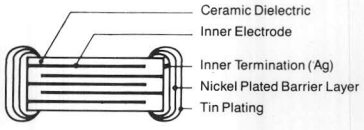
DIMENSIONS: in. (mm)	Size	EIA Code	L Length	W Width	T Thickness	g Insulation	e Termination
	★GRM 39	0603	.060±.006 (1.6±0.15)	.030±.006 (0.8±0.15)	Note 1: Thickness varies with capacitance value. See capacitance charts on following pages for thickness.	.020 (0.5)	.014±.006 (0.35±0.15)
	★GRM40	0805	.080±.006 (2.0±0.15)	.050±.006 (1.25±0.15)		.030 (0.75)	.020±.010 (0.5±0.25)
	★GRM42-6	1206	.125±.006 (3.2±0.15)	.063±.006 (1.6±0.15)		.040 (1.0)	.020±.010 (0.5±0.25)
	★GRM42-2	1210	.125±.006 (3.2±0.15)	.100±.006 (2.5±0.15)		.040 (1.0)	.020±.010 (0.5±0.25)
	★★GRM43-2	1812	.180±.012 (4.6±0.3)	.125±.008 (3.2±0.2)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM43-4	1825	.180±.012 (4.6±0.3)	.250±.016 (6.35±0.4)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM44-1	2220*	.220±.012 (5.6±0.3)	.200+.010-.025 (5.1+0.25-0.5)		.080 (2.0)	.025±.015 (0.63±0.38)
	★★GRM44	2225*	.220±.012 (5.6±0.3)	.250±.016 (6.35±0.4)		.080 (2.0)	.025±.015 (0.63±0.38)

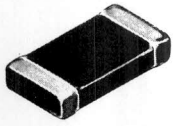
*Non EIA–Standard Size

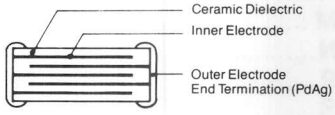
CHIP TERMINATION DIAGRAMS

Nickel Barrier Layer (Standard)	Palladium Silver
GRM Series	**GR Series**







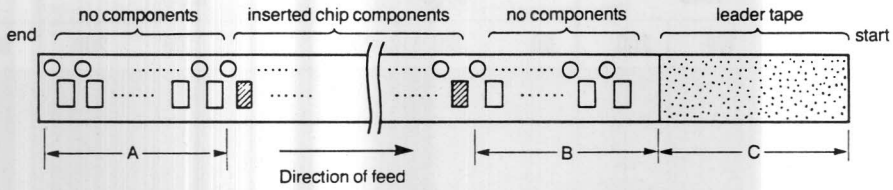


★Available as standard through authorized Murata Electronics Distributors.
★★Contact your local Murata Electronics Sales Office for standard values in these series.

Note: Other Terminations Available Upon Request. Please Contact Local Sales Office.

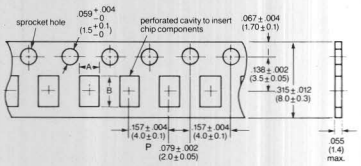
TAPE & REEL
FOR AUTOMATIC INSERTION

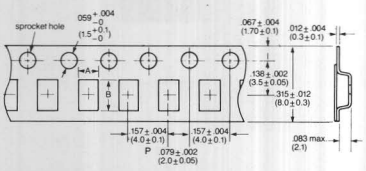
DIMENSIONS: in. (mm)
TAIL AND LEADER TAPE

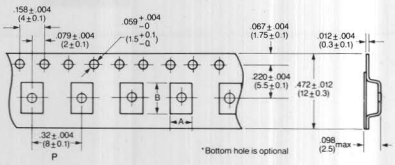


	Tail Tape (A)	Empty Cavities (B)	Leader Tape (C)
EIA-481-1	6.3 to 8.3 (160 to 200)	6.3 to 7.4 (160 to 188)	9.0 to 9.8 (230 to 250)

*20 to 30mm must be unsealed with remaining portion of empty cavities sealed.

8mm PUNCHED (PAPER)		GR(M)39 0603	GR(M)40 0805	GR(M)42-6 1206	GR(M)42-2 1210
	Tape A max.	.047 (1.2)	.065 (1.65)	.087 (2.2)	.116 (2.95)
	Tape B max.	.079 (2.0)	.095 (2.4)	.150 (3.8)	.144 (3.65)
	Chip T max.	.035 (0.9)	.040 (1.0)	.040 (1.0)	.040 (1.0)
	Tape Pitch: P	.157±.004 (4.0±0.1)	.157±.004 (4.0±0.1)	.157±.004 (4.0±0.1)	.157±.004 (4.0±0.1)

8mm EMBOSSED (PLASTIC)			GR(M)40 0805	GR(M)42-6 1206	GR(M)42-2 1210
	Tape A max.	N/A	.061 (1.55)	.079 (2.0)	.114 (2.9)
	Tape B max.		.093 (2.35)	.142 (3.6)	.142 (3.6)
	Chip T max.		.053 (1.35)	.060 (1.5)	.060 (1.5)
	Tape Pitch: P		.157±.004 (4.0±0.1)	.157±.004 (4.0±0.1)	.157±.004 (4.0±0.1)

12mm EMBOSSED (PLASTIC)		GR(M)43-2 1812	GR(M)43-4 1825	GR(M)44-1 2220	GR(M)44 2225
	Tape A max.	.146 (3.7)	.197 (5.0)	.209 (5.3)	.264 (6.7)
	Tape B max.	.197 (5.0)	.268 (6.8)	.244 (6.2)	.248 (6.3)
	Chip T max.	.080 (2.0)	.080 (2.0)	.080 (2.0)	.080 (2.0)
	Tape Pitch: P	.320±.004 (8±0.1)	.320±.004 (8±0.1)	.320±.004 (8±0.1)	.320±.004 (8±0.1)

CHIP MARKING

1. The capacitance value is expressed in pF.
2. A two character marking system will be used. The first character will be an alphabetic symbol and it will designate the 1st and 2nd figures of capacitance. The second character will be a numerical digit and it will designate the decimal multiplier of capacitance.
   Examples: $A1 = 1 \times 10^1 = 10pF$
   $J5 = 2.2 \times 10^5 = 0.22\mu F$
3. The marking shall appear in black or legible contrast. The orientation of the marking shall be as illustrated.
4. Marking resistance to solvents per EIA-RS 198 method 210

GR39
No Marking

GR40

GR42-6, 42-2, 43-2, 44-1, 44

GR43-4

TC BAR CODE
Where chip marking is required, bar code designations for temperature coefficients (T.C.s) will be provided as listed below.
NPO = □□, N150 = □□, N220 = □□,
N330 = □□, N470 = □□, N750 = □□,
Y5V = □□, Z5U = □□, X7R = □□
Other T.C. Designators are available. Contact your local Murata Electronics Sales Office.

T.C. Bar

Base Cap. Code

Multiplier

CHIP MARKING SPECIFICATIONS

Alphabetic Character	Significant Figures	Alphabetic Character	Significant Figures	Alphabetic Character	Significant Figures
A	1.0	L	2.7	W	6.8
B	1.1	M	3.0	X	7.5
C	1.2	N	3.3	Y	8.2
D	1.3	P	3.6	Z	9.1
E	1.5	Q	3.9	a	2.5
F	1.6	R	4.3	b	3.5
G	1.8	S	4.7	d	4.0
H	2.0	T	5.1	e	4.5
J	2.2	U	5.6	f	5.0
K	2.4	V	6.2	m	6.0
				n	7.0
				t	8.0
				y	9.0

Numeric Character	Decimal Multiplier
0	10^0
1	10^1
2	10^2
3	10^3
4	10^4
5	10^5
6	10^6
7	10^7
8	10^8
9	10^{-1}

COG

MURATA DESIGNATION	GRM 39			GRM 40			GRM 42-6			GRM 42-2		
EIA TYPE DESIGNATION	0603			0805			1206			1210		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) (NOTE) 1.0												
10			10									
						56						
100		160				220			160			240
	560			330	360				470			430
				510	680		750	750				
1000							1000					1000
				2400				1800		2400	1300	
										2700	2000	
							6200			7500	4300	
(µF) .01												
.1												

Note: Capacitance values = EIA 24 Step = 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91
For values under 1.0pF and other values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

Dimensions (mm)	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : $0.7^{+0}_{-0.2}$	1000	4000	4000	10000	10000
T : 0.8 ±0.1	1000	4000	N/A	10000	N/A
T : $1.0^{+0}_{-0.2}$	1000	4000	3000	10000	10000
T : $1.25^{+0}_{-0.2}$*	1000	N/A	3000	N/A	10000
T : $1.5^{+0}_{-0.2}$	1000	N/A	2000	N/A	8000

*GRM 40 T = 1.25 ± .1

COG

MURATA DESIGNATION	GRM 43-2			GRM 43-4			GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812			1825			2220			2225		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) (NOTE) 1.0												
10												
100												
1000	1000	1000	330 620 1000 2400	1000	1000	560 1800 2400 4700	1000	1000	820 1600 3600 6200	1000	1300	680 2200 3000 7500
3000	3000											
4700	3900											
(µF) .01	.011	.011		8200	8200		8200	8200		.01	.01	
				.016	.016		.018	.016		.022	.022	
							.036	.027		.033	.033	
.1												

Note: Capacitance values = EIA 24 Step = 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91
For values under 1.0pF and other values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

Dimensions (mm)	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : 1.25 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 1.5 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 2.0 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	4000

CHIPS–
GRM Series

HIGH DIELECTRIC CONSTANT TYPE X7R

MURATA DESIGNATION	GRM 39					GRM 40					GRM 42-6					GRM 42-2				
EIA TYPE DESIGNATION	0603					0805					1206					1210				
WVDC	16	25	50	100	200	16	25	50	100	200	16	25	50	100	200	16	25	50	100	200
CAPACITANCE (pF) 100			220	220	220			220	220	220			220	220	220					
1000		3900		3300	1800		2200	8200	6800	1800					2200					1500
(µF).01	.012	.022	.015			.015	.012	.015	.015	8200			.015	.015	.018		.022			4700 8200
	.047					.027	.022					.022	.027						.027	.047
						.047		.056				.033		.039					.047	
							.1				.1	.047					.1	.068	.1	
.1						.15					.12		.15			.12		.1		
												.22				.22	.18	.22		
											.33					.27	.27			
																.47				
1.0																				

Note: Capacitance values = EIA 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : $0.7^{+0}_{-0.2}$	1000	4000	4000	10000	10000
T : 0.8 ±0.1	1000	4000	N/A	10000	N/A
T : $1.0^{+0}_{-0.2}$	1000	4000	3000	10000	10000
T : $1.25^{+0}_{-0.2}$*	1000	N/A	3000	N/A	10000
T : $1.5^{+0}_{-0.2}$	1000	N/A	2000	N/A	8000

*GRM 40 T = 1.25 ± .1

HIGH DIELECTRIC CONSTANT TYPE X7R

MURATA DESIGNATION	GRM 43-2					GRM 43-4			GRM 44-1				GRM 44		
EIA TYPE DESIGNATION	1812					1825			2220				2225		
WVDC	16	25	50	100	200	50	100	200	25	50	100	200	50	100	200
CAPACITANCE (pF) 100															
1000															
(µF).01			.01	.012	.01 .012										
							.033	.022 .033				.022 .033			.033
					.056	.047		.047		.056	.056	.047		.056	
		.1		.082 .1	.1								.082		.082
.1			.12 .15				.15				.15				.12
		.27		.22			.22	.27		.33	.27	.27		.27	
	.39	.39				.39	.33		.47	.39				.39	.33
	.56	.47	.47			.56					.47		.68	.68	
1.0									1.2	1.2			1.0 1.5		

Note: Capacitance values = EIA 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : 1.25 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 1.5 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 2.0 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	4000

HIGH DIELECTRIC CONSTANT TYPE Z5U

MURATA DESIGNATION	GRM 39			GRM 40			GRM 42-6			GRM 42-2		
EIA TYPE DESIGNATION	0603			0805			1206			1210		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) 1000		3300			6800	1500 3300			3300 6800			6800
(µF).01	.01		N/A		.015							.01
				.022 .033			.047	.022 .033			.022 .033	.022
.1				.1			.1			.1	.1	
							.22			.15 .33		
1.0												

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : $0.7^{+0}_{-0.2}$	1000	4000	4000	10000	10000
T : 0.8 ±0.1	1000	4000	N/A	10000	N/A
T : $1.0^{+0}_{-0.2}$	1000	4000	3000	10000	10000
T : $1.25^{+0}_{-0.2}$*	1000	N/A	3000	N/A	10000
T : $1.5^{+0}_{-0.2}$	1000	N/A	2000	N/A	8000

*GRM40 T= 1.25 ± .1

HIGH DIELECTRIC CONSTANT TYPE Z5U

MURATA DESIGNATION	GRM 43-2			GRM 43-4			GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812			1825			2220			2225		
WVDC	50	100	200	50	100	200	50	100	200	50	100	200
CAPACITANCE (pF) 1000												
(μF) .01			.033			.047						
		.068				.068						
		.1			.1	.1			.1			.1
.1		.12			.22				.22			.22
		.22						.33				
	.33			.33	.47						.33	
	.68										.47	
	1.0			1.0			1.0			1.0		
1.0							1.5			1.5		
										2.2		

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : 1.25 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 1.5 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : 2.0 $^{+0}_{-0.2}$	1000	N/A	1000	N/A	4000

CHIPS–
GRM Series

HIGH DIELECTRIC CONSTANT TYPE Y5V

MURATA DESIGNATION	GRM 39				GRM 40				GRM 42-6				GRM 42-2			
EIA TYPE DESIGNATION	0603				0805				1206				1210			
WVDC	16	25	50	100	16	25	50	100	16	25	50	100	16	25	50	100
CAPACITANCE (pF) 1000				1200												
				4700		2200	2200									
								6800								
(µF).01																
							.022	.022				.022				
	.033															
			.047				.047				.047	.047				.047
						.068				.068						.068
						.1					.1					.1
.1																
		.15			.1		.15		.15	.15						
	.22				.22				.22	.22						
						.47			.47		.47					
													.68		.68	
					1.0					1.0			1.0	1.0		
1.0														1.5		
									2.2				2.2			

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : $0.7^{+0}_{-0.2}$	1000	4000	4000	10000	10000
T : 0.8 ±0.1	1000	4000	N/A	10000	N/A
T : $1.0^{+0}_{-0.2}$	1000	4000	3000	10000	10000
T : $1.25^{+0}_{-0.2}$*	1000	N/A	3000	N/A	10000
T : $1.5^{+0}_{-0.2}$	1000	N/A	2000	N/A	8000

*GRM40 T= 1.25 ± .1

HIGH DIELECTRIC CONSTANT TYPE Y5V

MURATA DESIGNATION	GRM 43-2				GRM 43-4		GRM 44-1			GRM 44		
EIA TYPE DESIGNATION	1812				1825		2220			2225		
WVDC	16	25	50	100	50	100	25	50	100	25	50	100
CAPACITANCE (pF) 1000												
(µF).01												
.1						.1						
				.15	.22	.22						
				.22		.33			.33			.47
						.47						.68
									.68	.68		
1.0		1.0	1.0		1.0		1.0				1.0	
					1.5			1.0				
							1.5	1.5			1.5	
	2.2						2.2	2.2			3.3	

Note: Capacitance values = EIA 6 Step = 10, 15, 22, 33, 47, 68. For values not listed, contact your local Murata Electronics Sales Office.

STANDARD THICKNESS/PACKAGING SPECIFICATIONS

DIMENSIONS: mm	Bulk	Tape			
	Pcs/bag (typical)	Pcs/7 inch (178 mm) reel		Pcs/13 inch (330 mm) reel	
	Plastic	Paper	Embossed	Paper	Embossed
T : $1.25^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : $1.5^{+0}_{-0.2}$	1000	N/A	1000	N/A	5000
T : $2.0^{+0}_{-0.2}$	1000	N/A	1000	N/A	4000

CHIPS–GRM Series
FOR LOW PROFILE AND SUB-PLCC
HIGH DIELECTRIC CONSTANT TYPE X7R, Y5V

MURATA DESIGNATION	GRM 40-024						GRM 40-037						GRM 40-026					
EIA TYPE DESIGNATION	0805						0805						0805					
MAX THICKNESS	.020						.026						.028					
WVDC	16		25		50		16		25		50		16		25		50	
TEMPERATURE CHARACTERISTIC	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V	X7R	Y5V
CAPACITANCE (pF) 100					220													
1000						1000												
			2200	2200	6800													
.01 (µF)	.01		.01			.01					.01							
	.027			.033			.033		.015		.018	.027	.033		.015		.012	.033
		.047					.056		.022	.056		.047	.047		.022		.015	.047
.1		.1								.1						.1		
								.15						.15				
1.0								.22										

PACKAGING = Bulk: 1,000 pcs/bag **TAPE AND REEL:** 4,000 pcs/7″ (178mm) Reel, 10,000 pcs/13″ (330mm) Reel **Paper tape only.**

Note: For X7R, Capacitance values = E1A 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82.
For Z5U and Y5V, Capacitance values = E1A 6 Step = 10, 15, 22, 33, 47, 68.
For values not listed, please contact your local Murata Electronics Sales Office.

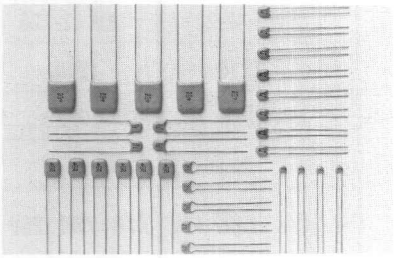
CHIPS–GRM Series
FOR LOW PROFILE AND SUB-PLCC
HIGH DIELECTRIC CONSTANT TYPE X7R, Z5U, Y5V

MURATA DESIGNATION	GRM 42-625				GRM 42-626		GRM 42-224				GRM 42-225				GRM 42-221			GRM 42-226		
EIA TYPE DESIGNATION	1206				1206		1210				1210				1210			1210		
MAXIMUM THICKNESS	.024				.028		.020				.024				.026			.028		
WVDC	16	25			16	25	16	25			16	25			25			25		
TEMPERATURE CHARACTERISTIC	Y5V	X7R	Z5U	Y5V	Y5V	Y5V	Y5V	X7R	Z5U	Y5V	Y5V	X7R	Z5U	Y5V	X7R	Z5U	Y5V	X7R	Z5U	Y5V
CAPACITANCE (pF) 100																				
1000		N/A										1000			N/A		N/A			
.01(μF)				.056				.018 .047		.068			.022					.056 .082		
.1			.1						.1			.1								
	.22			.22	.33	.22	.47			.15	.47 .68		.15	.15 .22		.22			.22 .33	.33
1.0																				

PACKAGING = Bulk: 1,000 pcs/bag **TAPE AND REEL:** 4,000 pcs/7" (178mm) Reel, 10,000 pcs/13" (330mm) Reel **Paper tape only.**

Note: For X7R, Capacitance values = E1A 12 Step = 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82.
For Z5U and Y5V, Capacitance values = E1A 6 Step = 10, 15, 22, 33, 47, 68.
For values not listed, please contact your local Murata Electronics Sales Office.

MONOLITHIC CERAMIC CAPACITORS
CONFORMAL COATED
RADIAL LEADS



OUTSTANDING CHARACTERISTICS

- **Wide capacitance, T.C., voltage and tolerance range**
- **Industry standard sizes**
- **Tape and reel available for auto-insertion**
- **Various lead spacing available**
- **Marking standard or to customer specification**
- **Coating material meets UL94V-0**

PART NUMBERING SYSTEM

RPE 110-XXX X7R 103 K 050V

CAPACITOR TYPE AND SIZE

Used only for tape and reel and other variations.

TEMPERATURE CHARACTERISTICS (Note 3)
COG=0, ±30ppm (Notes 1, 2)
X7R=±15%
Z5U=+22, −56%
Y5V=+22, −82%
(See Note 2 below)
P2H=N150±60ppm
R2H=N220±60ppm
S2H=N330±60ppm
T2H=N470±60ppm
U2J=N750±120ppm

CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

CAPACITANCE TOLERANCE (Note 2)
★COG: (10pF or less)
★C=±.25pF
★D=±.5pF
★J=±5%
★K=±10%
★X7R: K=±10%
★M=±20%
★Z5U: M=±20%
★Z=+80, −20%
★Y5V: Z=+80, −20%

VOLTAGE
Identified by a three-digit number. 050 and 100V standard (200V and 500V on special request)

NOTES: T.C. Tolerance

1.

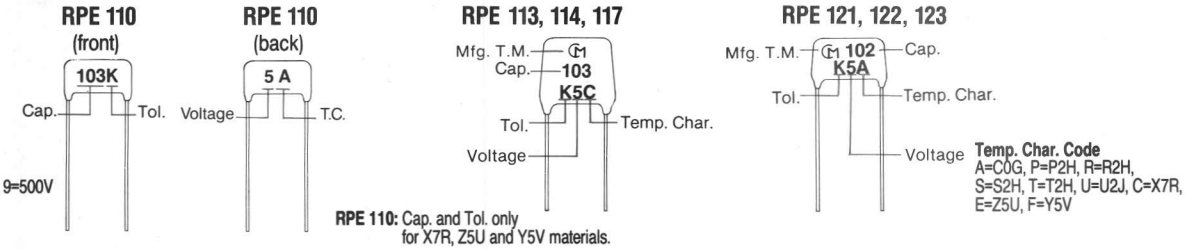
Capacitance (pF)	T.C. Tolerance (ppm)
10 and over	± 30(G)
4.0-9.9	± 60(H)
2.1-3.9	±120(J)
.4-2.0	±250(K)

Refer to EIA RS-198 for limitations.

2. Refer to EIA RS-198 for limitations.
3. Other T.C.s available on special request.

MARKINGS

★Available as standard through authorized Murata Electronics Distributors.

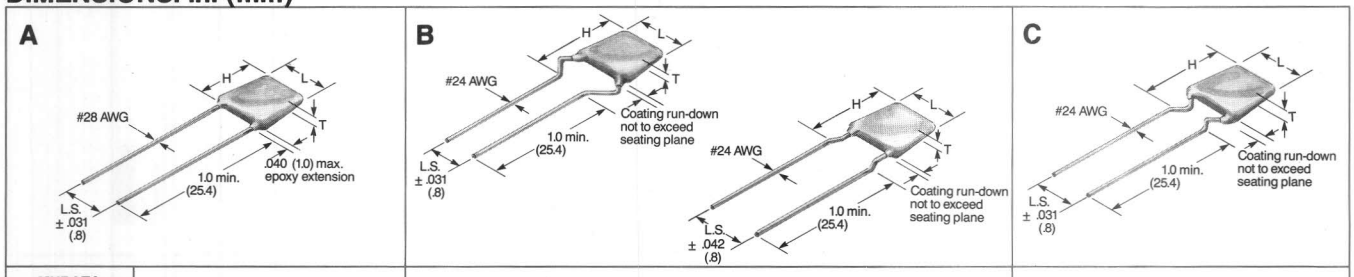


Voltage Code
2=25V, 5=50V,
1=100V, 6=200V, 9=500V

RPE 110: Cap. and Tol. only for X7R, Z5U and Y5V materials.

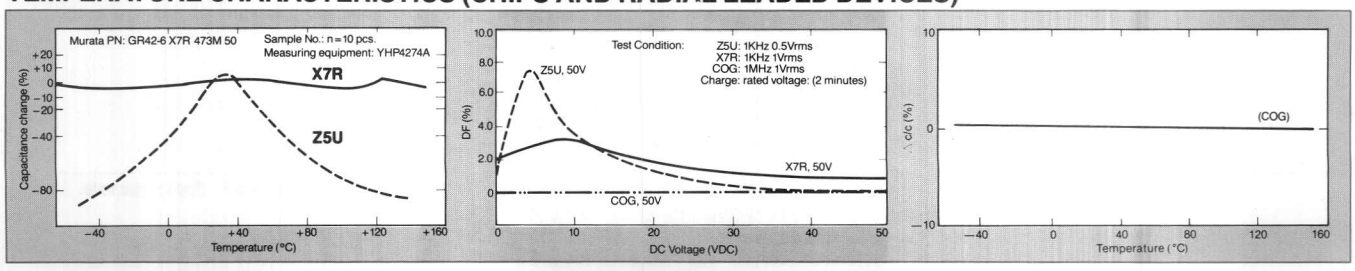
Temp. Char. Code
A=C0G, P=P2H, R=R2H,
S=S2H, T=T2H, U=U2J, C=X7R,
E=Z5U, F=Y5V

DIMENSIONS: in. (mm)



MURATA DESIGNATION	RPE 110	RPE 121/RPE122	RPE 123
L	.138 (3.5)	.200 (5.1)	.300 (7.6)
H	.120 (3.1)	.250 (6.4)	.275 (7.0)
T	.100 (2.5)	.125 (3.2)	.125 (3.2)
L.S.	.100 (2.5)	.100 (2.5)/.200 (5.1)	.200 (5.1)

TEMPERATURE CHARACTERISTICS (CHIPS AND RADIAL LEADED DEVICES)



MONOLITHIC CERAMIC CAPACITORS
CONFORMAL COATED
RADIAL LEADS

50-500 VDC

Type	Voltage Rating	Capacitance (pF) (μF) ★C0G (NPO) (A)	★X7R (C)	★Z5U (E)
★RPE110	★ 50V	1 – 1,000	220 – .033	1,000 – .068
	★100V	1 – 1,000	220 – .012	1,000 – .015
	200V	1 – 130	220 – 5,600	1,000 – 5,600
★RPE121/122	★ 50V	1 – 4,300	330 – .15	1,000 – .33
	★100V	1 – 3,300	330 – .1	1,000 – .1
	200V	1 – 360	330 – .047	1,000 – .047
	500V	1 – 130	330 – 5,600	1,000 – 5,600
★RPE123	★ 50V	—	—	.47 – 1.0
	★100V	—	—	—
	200V	—	—	—
	500V	—	—	—
★RPE113	★ 50V	4,300 – .02	.15 – 1.0	.33 – 1.5
	★100V	2,000 – .012	.1 – .47	.1 – .68
	200V	360 – 3,900	.047 – .15	.047 – .15
	500V	130 – 1,000	5,600 – 0.33	5,600 – .033
★RPE114	★ 50V	.02 – .033	1.0 – 1.8	1.5 – 3.3
	★100V	.012 – .027	.47 – 1.0	.68 – 1.0
	200V	3,900 – .01	.15 – .56	.15 – .47
	500V	1,000 – 2,400	.033 – .1	.033 – .1
★RPE117	★ 50V	.033 – .068	1.8 – 2.2	3.3 – 5.6
	★100V	.027 – .056	1.0 – 1.5	1.0 – 2.2
	200V	.01 – .027	.56 – 1.0	.47 – 1.0
	500V	2,400 – 6,200	.1 – .22	.1 – .22

TEMPERATURE COMPENSATING 50-100 VDC

Type	Voltage Rating	Capacitance (pF) N150 (P2H) (P)	N220 (R2H) (R)	N330 (S2H) (S)	N470 (T2H) (T)	N750 (U2J) (U)
RPE110	50V	1 - 360	1 - 560	1 - 470	1 - 390	1 - 1,800
	100V	1 - 330	1 - 510	1 - 430	1 - 51	1 - 960
RPE121/122	50V	1 - 2,400	1 - 2,700	1 - 3,300	1 - 1,200	15 - 7,500
	100V	1 - 2,200	1 - 2,400	1 - 3,000	1 - 240	15 - 4,700

CAPACITANCE TOLERANCE (Note 2)

C0G: (10pF or less) C = ±25pF; D = ±5pF; (over 10pF) J = ±5%; K = ±10%;
X7R: K = ±10%; M = ±20%
Z5U: M = ±20%; Z = +80, −20%

TEMPERATURE CHARACTERISTICS

C0G=0±30 ppm (Note 1), -55°C to +125°C
X7R=±15%, -55°C to +125°C
Z5U=+22, -56%, +10°C to +85°C
N150=±60 ppm, -55°C to +125°C
N220=±60 ppm, -55°C to +125°C
N330=±60 ppm, -55°C to +125°C
N470=±60 ppm, -55°C to +125°C
N750=±120 ppm, -55°C to +125°C

NOTES: T.C. Tolerance

1.

Capacitance (pF)	T.C. Tolerance (ppm)
.4-2.0	±250 (K)
2.1-3.9	±120 (J)
4.0-9.9	± 60 (H)
10 and over	± 30 (G)

Refer to EIA RS198 for limitations.

2. Other T.C.s available on special request.

PREFERRED VALUES

Cap.	Part No. ±5%
C0G (NPO) 50V	
12pF	RPE110C0G120J50V
15	RPE110C0G150J50V
18	RPE110C0G180J50V
20	RPE110C0G200J50V
22	RPE110C0G220J50V
27	RPE110C0G270J50V
33	RPE110C0G330J50V
36	RPE110C0G360J50V
39	RPE110C0G390J50V
47	RPE110C0G470J50V
56	RPE110C0G560J50V
68	RPE110C0G680J50V
82	RPE110C0G820J50V
100	RPE110C0G101J50V
120	RPE110C0G121J50V
150	RPE110C0G151J50V
180	RPE110C0G181J50V
220	RPE110C0G221J50V
270	RPE110C0G271J50V
330	RPE110C0G331J50V
390	RPE110C0G391J50V
470	RPE110C0G471J50V
560	RPE110C0G561J50V
680	RPE110C0G681J50V
820	RPE110C0G821J50V
1000	RPE110C0G102J50V
820	RPE121C0G821J50V
820	RPE122C0G821J50V
1000	RPE121C0G102J50V
1000	RPE122C0G102J50V
1200	RPE121C0G122J50V
1200	RPE122C0G122J50V
1500	RPE121C0G152J50V
1500	RPE122C0G152J50V
1800	RPE121C0G182J50V
1800	RPE122C0G182J50V
2200	RPE121C0G222J50V
2200	RPE122C0G222J50V
2700	RPE121C0G272J50V
2700	RPE122C0G272J50V
3300	RPE121C0G332J50V
3300	RPE122C0G332J50V
3900	RPE122C0G392J50V
4700	RPE123C0G472J50V
5600	RPE123C0G562J50V
6800	RPE113C0G682J50V
8200	RPE113C0G822J50V
.01μF	RPE113C0G103J50V
.012	RPE113C0G123J50V
.015	RPE113C0G153J50V

Cap.	Part No. ±5%
C0G (NPO) 50V	
.018μF	RPE114C0G183J50V
.022	RPE114C0G223J50V
.027	RPE114C0G273J50V
.033	RPE117C0G333J50V
.056	RPE117C0G563J50V
.062	RPE117C0G683J50V
C0G (NPO) 100V	
12pF	RPE110C0G120J100V
15	RPE110C0G150J100V
18	RPE110C0G180J100V
20	RPE110C0G200J100V
22	RPE110C0G220J100V
27	RPE110C0G270J100V
33	RPE110C0G330J100V
36	RPE110C0G360J100V
39	RPE110C0G390J100V
47	RPE110C0G470J100V
56	RPE110C0G560J100V
68	RPE110C0G680J100V
75	RPE110C0G750J100V
82	RPE110C0G820J100V
100	RPE110C0G101J100V
120	RPE110C0G121J100V
150	RPE110C0G151J100V
180	RPE110C0G181J100V
220	RPE110C0G221J100V
270	RPE110C0G271J100V
330	RPE110C0G331J100V
390	RPE110C0G391J100V
470	RPE110C0G471J100V
560	RPE110C0G561J100V
680	RPE110C0G681J100V
560	RPE122C0G561J100V
680	RPE121C0G681J100V
680	RPE122C0G681J100V
750	RPE121C0G751J100V
750	RPE122C0G751J100V
820	RPE121C0G821J100V
820	RPE122C0G821J100V
1000	RPE121C0G102J100V
1000	RPE122C0G102J100V
1200	RPE121C0G122J100V
1200	RPE122C0G122J100V
1500	RPE121C0G152J100V
1500	RPE122C0G152J100V
1800	RPE121C0G182J100V
1800	RPE122C0G182J100V
2200	RPE121C0G222J100V
2200	RPE122C0G222J100V

Cap.	Part No. ±5%
C0G (NPO) 100V	
2700pF	RPE121C0G272J100V
2700	RPE122C0G272J100V
3300	RPE121C0G332J100V
3300	RPE122C0G332J100V
3900	RPE123C0G392J100V
4700	RPE123C0G472J100V
5600	RPE123C0G562J100V
6200	RPE123C0G622J100V
6800	RPE123C0G682J100V
8200	RPE113C0G822J100V
.01μF	RPE113C0G103J100V
.012	RPE113C0G123J100V
.015	RPE114C0G153J100V
.018	RPE114C0G183J100V
.022	RPE114C0G223J100V
.027	RPE114C0G273J100V
.033	RPE114C0G333J100V
.033	RPE117C0G333J100V
.047	RPE117C0G473J100V
.056	RPE117C0G563J100V
X7R 50V	**±10%**
220pF	RPE110X7R221K50V
270	RPE110X7R271K50V
330	RPE110X7R331K50V
390	RPE110X7R391K50V
470	RPE110X7R471K50V
560	RPE110X7R561K50V
680	RPE110X7R681K50V
750	RPE110X7R751K50V
820	RPE110X7R821K50V
1000	RPE110X7R102K50V
1000	RPE122X7R102K50V
1200	RPE110X7R122K50V
1500	RPE110X7R152K50V
1800	RPE110X7R182K50V
2200	RPE110X7R222K50V

★All preferred values are available as standard through authorized Murata Electronics Distributors.

PREFERRED VALUES

Cap.	Part No. ±10%
X7R 50V	
2700pF	RPE110X7R272K50V
3300	RPE110X7R332K50V
3300	RPE122X7R332K50V
3600	RPE110X7R362K50V
3900	RPE110X7R392K50V
4700	RPE110X7R472K50V
4700	RPE122X7R472K50V
5600	RPE110X7R562K50V
6200	RPE110X7R622K50V
6800	RPE110X7R682K50V
7500	RPE110X7R752K50V
.01μF	RPE110X7R103K50V
.01	RPE121X7R103K50V
.01	RPE122X7R103K50V
.015	RPE110X7R153K50V
.015	RPE122X7R153K50V
.018	RPE110X7R183K50V
.018	RPE122X7R183K50V
.022	RPE110X7R223K50V
.022	RPE121X7R223K50V
.022	RPE122X7R223K50V
.027	RPE121X7R273K50V
.027	RPE122X7R273K50V
.033	RPE110X7R333K50V
.033	RPE121X7R333K50V
.033	RPE122X7R333K50V
.039	RPE121X7R393K50V
.039	RPE122X7R393K50V
.047	RPE121X7R473K50V
.047	RPE122X7R473K50V
.056	RPE122X7R563K50V
.056	RPE122X7R563K50V
.068	RPE121X7R683K50V
.068	RPE122X7R683K50V
.082	RPE121X7R823K50V
.082	RPE122X7R823K50V
.1	RPE121X7R104K50V
.1	RPE122X7R104K50V
.12	RPE121X7R124K50V
.12	RPE122X7R124K50V
.15	RPE121X7R154K50V
.15	RPE122X7R154K50V
.18	RPE121X7R184K50V
.18	RPE122X7R184K50V
.22	RPE123X7R224K50V
.27	RPE123X7R274K50V
.33	RPE123X7R334K50V
.39	RPE113X7R394K50V
.47	RPE113X7R474K50V
.56	RPE113X7R564K50V
.68	RPE113X7R684K50V
.82	RPE113X7R824K50V
1.0	RPE113X7R105K50V
1.2	RPE114X7R125K50V
1.5	RPE114X7R155K50V
1.8	RPE114X7R185K50V
2.2	RPE117X7R225K50V
X7R 100V	
220pF	RPE110X7R221K100V
270	RPE110X7R271K100V
330	RPE110X7R331K100V
470	RPE110X7R471K100V
560	RPE110X7R561K100V
680	RPE110X7R681K100V
750	RPE110X7R751K100V
820	RPE110X7R821K100V
1000	RPE110X7R102K100V
1500	RPE110X7R152K100V
1800	RPE110X7R182K100V
2200	RPE110X7R222K100V
2700	RPE110X7R272K100V
3300	RPE110X7R332K100V
3600	RPE110X7R362K100V
3900	RPE110X7R392K100V
4700	RPE110X7R472K100V

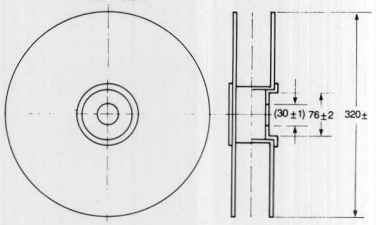
Cap.	Part No. ±10%
X7R 100V	
5600pF	RPE110X7R562K100V
6800	RPE110X7R682K100V
8200	RPE110X7R822K100V
.01μF	RPE110X7R103K100V
.01	RPE121X7R103K100V
.01	RPE122X7R103K100V
.012	RPE110X7R123K100V
.012	RPE122X7R123K100V
.015	RPE121X7R153K100V
.015	RPE122X7R153K100V
.018	RPE121X7R183K100V
.018	RPE122X7R183K100V
.022	RPE121X7R223K100V
.022	RPE122X7R223K100V
.027	RPE121X7R273K100V
.027	RPE122X7R273K100V
.033	RPE121X7R333K100V
.033	RPE122X7R333K100V
.039	RPE121X7R393K100V
.039	RPE122X7R393K100V
.047	RPE121X7R473K100V
.047	RPE122X7R473K100V
.056	RPE121X7R563K100V
.056	RPE122X7R563K100V
.068	RPE121X7R683K100V
.068	RPE122X7R683K100V
.082	RPE121X7R823K100V
.082	RPE122X7R823K100V
.1	RPE121X7R104K100V
.1	RPE122X7R104K100V
.12	RPE123X7R124K100V
.15	RPE123X7R154K100V
.18	RPE113X7R184K100V
.22	RPE113X7R224K100V
.27	RPE113X7R274K100V
.33	RPE113X7R334K100V
.39	RPE114X7R394K100V
.47	RPE114X7R474K100V
.56	RPE114X7R564K100V
.68	RPE114X7R684K100V
.82	RPE114X7R824K100V
1.0	RPE114X7R105K100V
1.2	RPE117X7R125K100V
Z5U 50V	**±20%**
1000pF	RPE110Z5U102M50V
1500	RPE110Z5U152M50V
1800	RPE110Z5U182M50V
2200	RPE110Z5U222M50V
2700	RPE110Z5U272M50V
3300	RPE110Z5U332M50V
3900	RPE110Z5U392M50V
4700	RPE110Z5U472M50V
5600	RPE110Z5U562M50V
6800	RPE110Z5U682M50V
8200	RPE110Z5U822M50V
.01μF	RPE110Z5U103M50V
.01	RPE121Z5U103M50V
.01	RPE122Z5U103M50V
.015	RPE110Z5U153M50V
.015	RPE122Z5U153M50V
.022	RPE110Z5U223M50V
.022	RPE122Z5U223M50V
.033	RPE110Z5U333M50V
.033	RPE122Z5U333M50V
.047	RPE110Z5U473M50V
.047	RPE122Z5U473M50V
.068	RPE110Z5U683M50V
.068	RPE122Z5U683M50V
.1	RPE121Z5U104M50V
.1	RPE122Z5U104M50V
.15	RPE121Z5U154M50V
.15	RPE122Z5U154M50V
.18	RPE121Z5U184M50V
.18	RPE122Z5U184M50V
.22	RPE121Z5U224M50V

Cap.	Part No. ±20%
Z5U 50V	
.22μF	RPE122Z5U224M50V
.27	RPE121Z5U274M50V
.27	RPE122Z5U274M50V
.33	RPE121Z5U334M50V
.33	RPE122Z5U334M50V
.47	RPE123Z5U474M50V
.68	RPE123Z5U684M50V
1.0	RPE123Z5U105M50V
1.5	RPE113Z5U155M50V
2.2	RPE114Z5U225M50V
3.3	RPE114Z5U335M50V
4.7	RPE117Z5U475M50V
5.6	RPE117Z5U565M50V
Z5U 100V	
1000pF	RPE110Z5U102M100V
1500	RPE110Z5U152M100V
1800	RPE110Z5U182M100V
2200	RPE110Z5U222M100V
2700	RPE110Z5U272M100V
3300	RPE110Z5U332M100V
3900	RPE110Z5U392M100V
4700	RPE110Z5U472M100V
5600	RPE110Z5U562M100V
6800	RPE110Z5U682M100V
.01μF	RPE110Z5U103M100V
.01	RPE121Z5U103M100V
.01	RPE122Z5U103M100V
.015	RPE110Z5U153M100V
.015	RPE122Z5U153M100V
.018	RPE121Z5U183M100V
.018	RPE122Z5U183M100V
.022	RPE121Z5U223M100V
.022	RPE122Z5U223M100V
.033	RPE121Z5U333M100V
.033	RPE122Z5U333M100V
.039	RPE121Z5U393M100V
.039	RPE122Z5U393M100V
.047	RPE121Z5U473M100V
.047	RPE122Z5U473M100V
.068	RPE121Z5U683M100V
.068	RPE122Z5U683M100V
.1	RPE121Z5U104M100V
.1	RPE122Z5U104M100V
.12	RPE123Z5U124M100V
.15	RPE123Z5U154M100V
.22	RPE113Z5U224M100V
.33	RPE113Z5U334M100V
.47	RPE113Z5U474M100V
.68	RPE114Z5U684M100V
1.0	RPE114Z5U105M100V
1.5	RPE117Z5U155M100V
2.2	RPE117Z5U225M100V

*All preferred values are available as standard through authorized Murata Electronics Distributors.

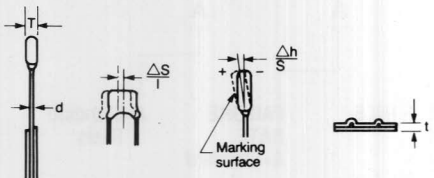
TAPE & REEL FOR AUTO-INSERTION

Reel Pack

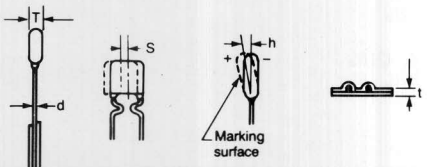


STANDARD QUANTITY PER REEL

	REEL	AMMO
RPE121	2500	2000
RPE122	2500	2000
RPE123	2500	2000
RPE113	2000	2000
RPE114	1500	1500

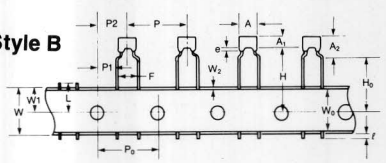


Style B,C,D



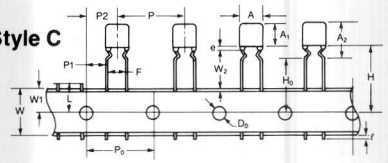
Style E,F, G

Style B



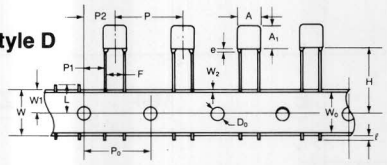
Fuji—RPE122-901
Panasert—RT-RPE122-905
Avisert, Universal—RPE122-906

Style C



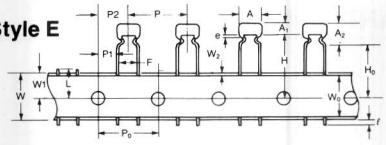
Fuji—RPE113-901

Style D



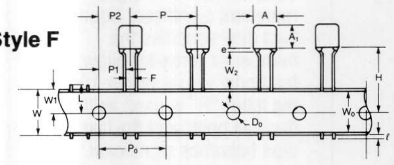
Fuji, Panasert—RB-RPE113-902
-RPE113-903
Avisert, Universal—RPE113-907

Style E



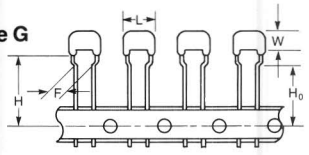
Fuji—RPE123-951
Avisert, Universal—RPE123-906

Style F



Fuji, Panasert—RB-RPE114-903
Avisert, Universal—RPE114-907

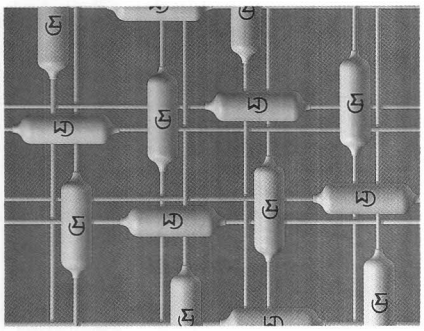
Style G



POSITION		RPE122-901	RPE122-905	RPE122-906	RPE113-901	RPE113-902	RPE113-903	RPE113-907	RPE123-901*	RPE123-906*	RPE114-903	RPE114-907	RPE121-191
STYLE	DIM.	B	B	B	C	D	D	D	E	E	F	F	G
Taping Pitch	P	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Feed Hole Pitch	P_0	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2	12.7±0.2
Feed Hole Position	P2	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3
Feed Hole Position	P1	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7
Lead Space	F	5.20±0.4	5.20±0.4	5.20±0.4	5.20±0.4	5.20±0.4	5.20±0.4	5.20±0.4	5.20±0.4	5.08±0.5	5.20±0.4	5.20±0.4	2.5±0.4
Body Width	A	5.0 max	5.0 max	5.0 max	7.5 max	7.5 max	7.5 max	7.5 max	7.5 max	7.5 max	10.0 max	10.0 max	5.0 max
Body Height	A_1	5.0 max	5.0 max	5.0 max	7.5 max	7.5 max	7.5 max	7.5 max	5.0 max	5.0 max	10.0 max	10.0 max	5.0 max
Body Height	A_2	6.3 max	8.5 max	6.3 max	10.0 max	—	—	—	6.3 max	6.3 max	13.5 max	—	6.3 max
Body Thickness	T	3.15 max	3.15 max	3.15 max	4.0 max	4.0 max	3.15 max	3.15 max	3.15 max	3.15 max	3.81 max	3.81 max	3.15 max
Deviation Along Tape	ΔS	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0	±2.0
Width of Tape Carrier	W	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5	18.0±0.5
Half Width of Tape Carrier	W1	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$	$9.0^{+0}_{-0.5}$
Lead Length	H_0	16.0±0.5	16.0±0.5	20.0±0.5	16.0±0.5	—	—	—	16.0±0.5	20.0±0.5	—	—	16.0±05
Lead Length	H	18.0±1.0	20.0±1.0	22.0±1.0	19.0±1.0	16.5±0.5	175±0.5	20.0±0.5	18.0±1.0	22.0±1.0	17.5±1.0	20.0±0.5	18.0±1.0
Lead Protrusion	l	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0	+0.5 to −1.0
Diameter of Feed Hole	D_0	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1
Lead Wire	d	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05	0.5±0.05
Total Tape Thickness	t	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2
Deviaton Across Tape	Δh	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0	±1.0
Cutting Position Failure	L	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$	$11.0^{+0}_{-1.0}$
Width of Masking Tape	W_0	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min	12.5 min
Margin Between Tapes	W_2	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5	1.5±1.5
Parts Length	e	1.5 max	1.5 max	1.5 max	1.0 max	1.0 max	1.0 max	1.0 max	1.0 max	1.0 max	1.5 max	1.5 max	1.5 max

*RPE 123 Series — Low Profile — contact your local Murata Electronics Sales Office for further information.

CONFORMAL COATED
AXIAL LEADED
MONOLITHIC CERAMIC CAPACITORS



- Industry Standard Sizes
- Wide Capacitance, T.C., Voltage and Tolerances Ranges
- Tape and Reel for Auto-Insertion

PART NUMBERING SYSTEM

SL10 5 E 104 Z A A

CAPACITOR TYPE AND SIZE

VOLTAGE
5=50V
1=100V
2=200V

TEMP. CHAR.
A=COG
C=X7R
E=Z5U

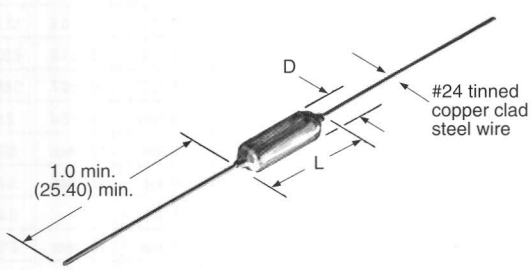
CAPACITANCE VALUE
Expressed in picofarads and Identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For fractional values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

TOLERANCE
COG
J=±5%
K=±10%
X7R
K=±10%
M=±20%
Z5U
Z=+80, –20%
M=±20%

FAILURE RATE
A=Standard

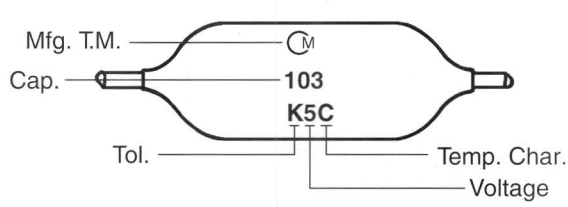
A=Standard Reels

DIMENSIONS: in. (mm)



Capacitor Type and Size	L max.	D max.
SL10	.170 (4.32)	.100 (2.54)
SL11	.170 (4.32)	.120 (3.05)
SL20	.260 (6.60)	.100 (2.54)
SL30	.290 (7.37)	.150 (3.81)
SL40	.400 (10.16)	.150 (3.81)

MARKINGS



Voltage Code
5=50V, 1=100V,
2=200V

Temp. Char. Code
A=COG, C=X7R,
E=Z5U

Note: Distribution Item Only.

CONFORMAL COATED AXIAL LEADED MONOLITHIC CERAMIC CAPACITORS

SPECIFICATIONS

MECHANICAL

Construction:
Epoxy encapsulated—meets flame test requirements of UL Standard 94V-0.
High-temperature solder—meets EIA RS-198C, Method B4, Condition B (260°C for 10 sec.).

Lead Material:
Solder Coated Copper Clad Steel

Solderability:
EIA RS-198C, Method B7. Solder temperature—230° ±5°C. Dwell time in solder—5 ± 1/2 seconds.

Terminal Strength:
EIA RS-198C, Method B5, Condition A (2.2 kg)

ELECTRICAL

Capacitance:
Within specified tolerance at 25°C and following test conditions.
COG—Greater than 1000pF with 1.0 vrms at 1 KHz.
—1000pF and less with 1.0 vrms at 1 MHz.
X7R—with 1.0 vrms at 1KHz
Z5U—with 0.5 vrms at 1KHz

Dissipation Factor:
At 25°C—same test conditions as capacitance.
COG—0.15% maximum
X7R—2.5% maximum
Z5U—3.0% maximum

Insulation Resistance:
EIA RS-198C, Method A4, Condition A
COG—100 gigohms or 1000 megohm x μF, whichever is less.
X7R—100 gigohms or 1000 megohm x μF, whichever is less.
Z5U—10 gigohms or 1000 megohm x μF, whichever is less.

Dielectric Withstanding Voltage:
EIA RS-198C, Method A3, (250% of rated voltage with current limited to 50 mA)

TAPE & REEL FOR AUTO-INSERTION

DIMENSIONS: in. (mm)

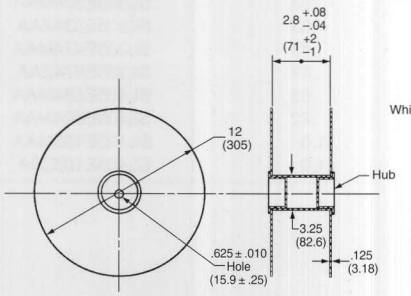


Figure 1 Standard Tape Reel

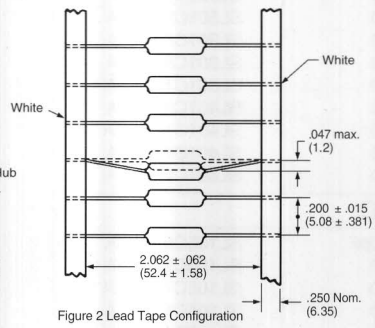


Figure 2 Lead Tape Configuration

NOTES:

1. Standard quantities per reel are

SL 10	5000pcs
SL 11	5000pcs
SL 20	5000pcs
SL 30	2500pcs
SL 40	2500pcs

2. Standard information marked on reel label is:
   a: Customers Part No.
   b: Our Part No.
   c: Quantity
   d: Inspection No.
3. Maximum 0.25% of capacitors per reel quantity may be missing with no consecutive misses.

Note: Distribution Item Only.

MONOLITHIC CERAMIC CAPACITORS
CONFORMAL COATED
AXIAL LEADED

★ **PREFERRED VALUES**

COG

Cap. Value	Part No.
200VDC	
10pF	SL102A100JAA
12	SL102A120JAA
15	SL102A150JAA
18	SL102A180JAA
22	SL102A220JAA
27	SL102A270JAA
33	SL102A330JAA
39	SL102A390JAA
47	SL102A470JAA
56	SL102A560JAA
68	SL102A680JAA
82	SL102A820JAA
100	SL102A101JAA
120	SL102A121JAA
100VDC	
150pF	SL101A151JAA
180	SL101A181JAA
220	SL101A221JAA
270	SL101A271JAA
330	SL101A331JAA
390	SL101A391JAA
470	SL101A471JAA
560	SL101A561JAA
680	SL101A681JAA
820	SL101A821JAA
1,000	SL101A102JAA
1,200	SL201A122JAA
1,500	SL201A152JAA
1,800	SL201A182JAA
2,200	SL201A222JAA
2,700	SL301A272JAA
3,300	SL301A332JAA
3,900	SL301A392JAA
4,700	SL301A472JAA
5,600	SL301A562JAA
6,800	SL301A682JAA
8,200	SL301A822JAA
.01μF	SL401A103JAA
.012	SL401A123JAA
.015	SL401A153JAA
50VDC	
1,000pF	SL105A102JAA
1,000	SL105A102KAA
1,200	SL115A122JAA
1,500	SL115A152JAA
1,800	SL115A182JAA
2,200	SL115A222JAA
2,700	SL115A272JAA
1,800	SL205A182JAA
4,700	SL305A472JAA
8,200	SL305A822JAA
10,000	SL405A103JAA
10,000	SL405A103KAA
12,000	SL405A123JAA

★All preferred values are available as standard through authorized Murata Electronics Distributors.

Note: Distribution Item Only.

X7R

Cap. Value	Part No.
200VDC	
220pF	SL102C221KAA
270	SL102C271KAA
330	SL102C331KAA
100VDC	
390pF	SL101C391KAA
470	SL101C471KAA
560	SL101C561KAA
680	SL101C681KAA
820	SL101C821KAA
1,000	SL101C102KAA
1,200	SL101C122KAA
1,500	SL101C152KAA
1,800	SL101C182KAA
2,200	SL101C222KAA
2,700	SL101C272KAA
3,300	SL101C332KAA
3,900	SL101C392KAA
4,700	SL101C472KAA
5,600	SL101C562KAA
6,800	SL101C682KAA
8,200	SL101C822KAA
10,000	SL101C103KAA
12,000	SL101C123KAA
15,000	SL201C153KAA
18,000	SL201C183KAA
22,000	SL201C223KAA
27,000	SL201C273KAA
33,000	SL301C333KAA
39,000	SL301C393KAA
47,000	SL301C473KAA
56,000	SL301C563KAA
68,000	SL301C683KAA
82,000	SL301C823KAA
100,000	SL301C104KAA
82,000	SL401C823KAA
100,000	SL401C104MAA
120,000	SL401C124KAA
150,000	SL401C154KAA
50VDC	
8,200pF	SL105C822KAA
10,000	SL105C103KAA
10,000	SL105C103MAA
12,000	SL105C123KAA
15,000	SL105C153KAA
18,000	SL105C183KAA
22,000	SL105C223KAA
27,000	SL105C273KAA
33,000	SL105C333KAA
39,000	SL105C393KAA
47,000	SL105C473KAA
56,000	SL115C563KAA
68,000	SL115C683KAA
82,000	SL115C823KAA
100,000	SL115C104KAA
100,000	SL115C104MAA
56,000	SL205C563KAA
68,000	SL205C683KAA
82,000	SL205C823KAA
100,000	SL205C104KAA
100,000	SL205C104MAA
120,000	SL305C124KAA
150,000	SL305C154KAA
180,000	SL305C184KAA
220,000	SL305C224KAA
270,000	SL305C274KAA
270,000	SL405C274KAA
330,000	SL405C334KAA

Z5U

Cap. Value	Part No.
100VDC	
.01μF	SL101E103MAA
.01	SL101E103ZAA
.015	SL101E153MAA
.022	SL101E223MAA
.033	SL201E333MAA
.047	SL201E473MAA
.068	SL301E683MAA
.10	SL301E104MAA
.10	SL301E104ZAA
.15	SL301E154MAA
.18	SL401A184MAA
.22	SL401E224MAA
.22	SL401E224ZAA
50VDC	
.01μF	SL105E103MAA
.01	SL105E103ZAA
.015	SL105E153MAA
.022	SL105E223MAA
.033	SL105E333MAA
.047	SL105E473MAA
.047	SL105E473ZAA
.068	SL105E683MAA
.10	SL105E104MAA
.15	SL105E154MAA
.22	SL105E224MAA
.22	SL105E224ZAA
.10	SL105E104ZAA
.33	SL115E334MAA
.33	SL115E334ZAA
.33	SL305E334MAA
.33	SL305E334ZAA
.47	SL305E474MAA
.47	SL305E474ZAA
.68	SL405E684MAA
.82	SL405E824MAA
1.0	SL405E105MAA
1.0	SL405E105ZAA

PORCELAIN MONOLITHIC CAPACITORS FOR MICROWAVE APPLICATIONS
MA SERIES 18, 58, 28 & 68 SERIES

CONFIGURATIONS AND DIMENSIONS – CASE SIZE 1 AND CASE SIZE 2

Type			Configuration	Dimensions: in. (mm)			Band	Termination
P90±20 ppm/°C	C0G±30 ppm/°C	CASE SIZE		Length	W±.010 (.25)	T max.	Y +.010 −.005 (+.25/−.1)	
★MA18	★MA58	1		.07 max. (1.8 max.)	.055 (1.4)	.055 (1.4)	.010 (.25)	Palladium Silver, Ni Interface & Solder (Sn 62)
★MA28	★MA68	2		.130 max. (3.3)	.110 (2.8)	.100* (2.5)	.015 (.4)	

PART NUMBERING SYSTEM – CASE SIZE 1

M A 1 8 101 J

CUBIC MONOLITHIC

A-STD SERIES

DIMENSIONAL AND T.C. CODE
1:P90 Case 1
5:C0G Case 1
2:P90 Case 2
6:NPO Case 2

TERMINATION CODE:
8:Pd/Ag, Ni interface, Solder (Sn62) (Preferred)

CAPACITANCE CODE:
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

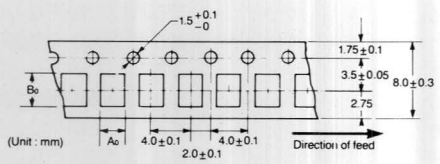
TOLERANCES:
*B: ±0.1pF
*C: ±0.25pF
*D: ±0.5pF
F: ±1%
G: ±2%
J: ±5%
*Available below 10pF only

SPECIFICATIONS

Quality Factor:	MA 18/28/58/68; Exceeds MIL-C-55681
Temperature Coefficient:	MA 18/28 Series; P90 ± 20ppm/°C, (−55°C to +125°C) MA 58/68 Series; C0G (NPO ± 30ppm/°C −55°C to +125°C)
Insulation Resistance:	MA 18/28; 1000K Megohms at +25°C, 100K Megohms at +125°C MA 58/68; 1000K Megohms at +25°C, 100K Megohms at +125°C
Dielectric Test Voltage:	MA 18/28/58/68; 250% of WVDC for 5 seconds
Capacitance Drift:	Meets or Exceeds MIL-C-55681
Aging:	Negligible for MA 18/28/58/68
Environmental Tests:	MIL-STD-202

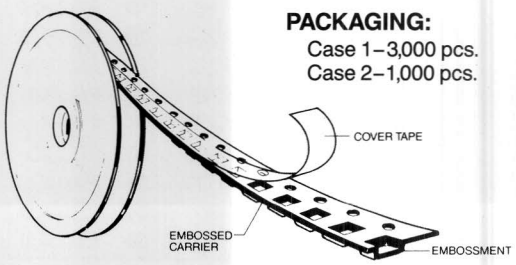
Shock:	Method 213, Condition J
Vibration:	Method 204, Condition B
Moisture Resistance:	Method 106
Solderability:	Method 208
Immersion:	Method 104, Condition B
Barometric Pressure:	Method 105, Condition B
Resistance to Soldering Heat:	Method 210, Condition B
Thermal Shock:	Method 107, Condition A
Life:	Method 108, Condition F
MARKING:	MA 18/28/58/68; Laser mark Capacitance Code, Tolerance Code, Logo (where space permits)

DIMENSIONS: in. (mm)



NOTE: 1 Ao & Bo ARE DETERMINED BY MAXIMUM SPECIFIED LENGTH AND WIDTH OF COMPONENTS PLUS 0.4±0.2 (0.016±0.008), PLUS THE ADDITIONAL REQUIREMENTS THAT COMPONENTS NOT BE ALLOWED TO ROTATE MORE THAN 20° WITHIN THE CAVITY CLEARANCE OR WHICHEVER CONDITION OCCURS FIRST.

TAPE-AND-REEL PACKAGING



PACKAGING:
Case 1–3,000 pcs.
Case 2–1,000 pcs.

★Contact your local Murata Electronics Distributor's office for specific standard values.

MA ★ 18 & 58 SERIES, P90 & C0G – CASE SIZE 1

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
0R1	0.1	B	150
0R2	0.2	B	150
0R3	0.3	B,C	150
0R4	0.4	B,C	150
0R5	0.5	B,C,D	150
0R6	0.6	B,C,D	150
0R7	0.7	B,C,D	150
0R8	0.8	B,C,D	150
0R9	0.9	B,C,D	150
★1R0	1.0	B,C,D	150
1R1	1.1	B,C,D	150
★1R2	1.2	B,C,D	150
1R3	1.3	B,C,D	150
1R4	1.4	B,C,D	150
★1R5	1.5	B,C,D	150
1R6	1.6	B,C,D	150
1R7	1.7	B,C,D	150
1R8	1.8	B,C,D	150
1R9	1.9	B,C,D	150
2R0	2.0	B,C,D	150
★2R2	2.2	B,C,D	150
2R4	2.4	B,C,D	150

@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
2R7	2.7	B,C,D	150
3R0	3.0	B,C,D	150
★3R3	3.3	B,C,D	150
3R6	3.6	B,C,D	150
★3R9	3.9	B,C,D	150
4R3	4.3	B,C,D	150
★4R7	4.7	B,C,D	150
★5R1	5.1	B,C,D	150
★5R6	5.6	B,C,D	150
6R2	6.2	B,C,D	150
★6R8	6.8	B,C,J,K,M	150
★7R5	7.5	B,C,J,K,M	150
★8R2	8.2	B,C,J,K,M	150
9R1	9.1	B,C,J,K,M	150
★100	10	F,G,J,K,M	150
110	11	F,G,J,K,M	150
120	12	F,G,J,K,M	150
130	13	F,G,J,K,M	150
★150	15	F,G,J,K,M	150
★160	16	F,G,J,K,M	150
★180	18	F,G,J,K,M	150

@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
200	20	F,G,J,K,M	150
★220	22	F,G,J,K,M	150
240	24	F,G,J,K,M	150
★270	27	F,G,J,K,M	150
300	30	F,G,J,K,M	150
330	33	F,G,J,K,M	150
360	36	F,G,J,K,M	150
★390	39	F,G,J,K,M	150
430	43	F,G,J,K,M	150
★470	47	F,G,J,K,M	150
510	51	F,G,J,K,M	150
★560	56	F,G,J,K,M	150
620	62	F,G,J,K,M	150
680	68	F,G,J,K,M	150
750	75	F,G,J,K,M	150
★820	82	F,G,J,K,M	150
910	91	F,G,J,K,M	150
★101	100	F,G,J,K,M	150
111**	110	F,G,J,K,M	150
121**	120	F,G,J,K,M	150
131**	130	F,G,J,K,M	150

@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
151**	150	F,G,J,K,M	150
161**	160	F,G,J,K,M	150
181**	180	F,G,J,K,M	150
201**	200	F,G,J,K,M	150
221**	220	F,G,J,K,M	150
241**	240	F,G,J,K,M	150
271**	270	F,G,J,K,M	150
301**	300	F,G,J,K,M	150
331**	330	F,G,J,K,M	150
361**	360	F,G,J,K,M	150
391**	390	F,G,J,K,M	150
431**	430	F,G,J,K,M	150
471**	470	F,G,J,K,M	150
511**	510	F,G,J,K,M	150
561**	560	F,G,J,K,M	150
621**	620	F,G,J,K,M	150
681**	680	F,G,J,K,M	150
751**	750	F,G,J,K,M	150
821**	820	F,G,J,K,M	150
911**	910	F,G,J,K,M	150
102**	1000	F,G,J,K,M	150

@ 125°C

**Extended Cap Range, C0G only

MA ★ 28 & 68, P90 & C0G – CASE SIZE 2

★Contact your local Murata Electronics Distributors Sales Office for standard tolerances in these values – J Tol.

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
0R1	0.1	B	500
0R2	0.2	B	500
0R3	0.3	B,C	500
0R4	0.4	B,C	500
0R5	0.5	B,C,D	500
0R6	0.6	B,C,D	500
0R7	0.7	B,C,D	500
0R8	0.8	B,C,D	500
0R9	0.9	B,C,D	500
★1R0	1.0	B,C,D	500
1R1	1.1	B,C,D	500
1R2	1.2	B,C,D	500
1R3	1.3	B,C,D	500
1R4	1.4	B,C,D	500
★1R5	1.5	B,C,D	500
1R6	1.6	B,C,D	500
1R7	1.7	B,C,D	500
1R8	1.8	B,C,D	500
1R9	1.9	B,C,D	500
2R0	2.0	B,C,D	500
2R1	2.1	B,C,D	500
★2R2	2.2	B,C,D	500
2R4	2.4	B,C,D	500
2R7	2.7	B,C,D	500
★3R0	3.0	B,C,D	500
3R3	3.3	B,C,D	500

*@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
3R6	3.6	B,C,D	500
★3R9	3.9	B,C,D	500
4R3	4.3	B,C,D	500
★4R7	4.7	B,C,D	500
★5R1	5.1	B,C,D	500
★5R6	5.6	B,C,D	500
★6R2	6.2	B,C,D	500
★6R8	6.8	B,C,J,K,M	500
7R5	7.5	B,C,J,K,M	500
★8R2	8.2	B,C,J,K,M	500
★9R1	9.1	B,C,J,K,M	500
★100	10	F,G,J,K,M	500
110	11	F,G,J,K,M	500
★120	12	F,G,J,K,M	500
★130	13	F,G,J,K,M	500
★150	15	F,G,J,K,M	500
160	16	F,G,J,K,M	500
★180	18	F,G,J,K,M	500
★200	20	F,G,J,K,M	500
★220	22	F,G,J,K,M	500
240	24	F,G,J,K,M	500
★270	27	F,G,J,K,M	500
★300	30	F,G,J,K,M	500
★330	33	F,G,J,K,M	500
★360	36	F,G,J,K,M	500
★390	39	F,G,J,K,M	500

*@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
430	43	F,G,J,K,M	500
★470	47	F,G,J,K,M	500
★510	51	F,G,J,K,M	500
★560	56	F,G,J,K,M	500
620	62	F,G,J,K,M	500
★680	68	F,G,J,K,M	500
★750	75	F,G,J,K,M	500
★820	82	F,G,J,K,M	500
910	91	F,G,J,K,M	500
★101	100	F,G,J,K,M	500
★111	110	F,G,J,K,M	300
★121	120	F,G,J,K,M	300
131	130	F,G,J,K,M	300
151	150	F,G,J,K,M	300
161	160	F,G,J,K,M	300
★181	180	F,G,J,K,M	300
★201	200	F,G,J,K,M	300
★221	220	F,G,J,K,M	200
241	240	F,G,J,K,M	200
★271	270	F,G,J,K,M	200
★301	300	F,G,J,K,M	200
★331	330	F,G,J,K,M	200
★361	360	F,G,J,K,M	200
391	390	F,G,J,K,M	200
431	430	F,G,J,K,M	200
★471	470	F,G,J,K,M	200

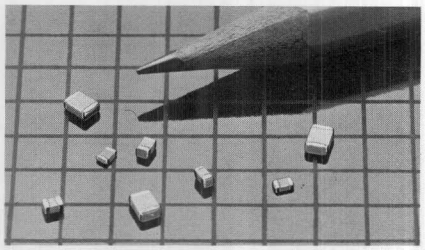
*@ 125°C

Cap. Code	Cap. pF	Cap. Tol.	WVDC*
★511	510	F,G,J,K,M	100
★561	560	F,G,J,K,M	100
★621	620	F,G,J,K,M	100
★681	680	F,G,J,K,M	50
751	750	F,G,J,K,M	50
821	820	F,G,J,K,M	50
911	910	F,G,J,K,M	50
★102	1000	F,G,J,K,M	50
112**	1100	F,G,J,K,M	50
122**	1200	F,G,J,K,M	50
132**	1300	F,G,J,K,M	50
152**	1500	F,G,J,K,M	50
162**	1600	F,G,J,K,M	50
182**	1800	F,G,J,K,M	50
202**	2000	F,G,J,K,M	50
222**	2200	F,G,J,K,M	50
242**	2400	F,G,J,K,M	50
272**	2700	F,G,J,K,M	50
302**	3000	F,G,J,K,M	50
332**	3300	F,G,J,K,M	50
362**	3600	F,G,J,K,M	50
392**	3900	F,G,J,K,M	50
432**	4300	F,G,J,K,M	50
472**	4700	F,G,J,K,M	50
502**	5000	F,G,J,K,M	50
512**	5100	F,G,J,K,M	50

*@ 125°C

**Extended Cap Range, C0G only

GRH708-710 SERIES
LOW COST HIGH FREQUENCY CHIP CAPACITORS FOR COMMUNICATIONS APPLICATIONS

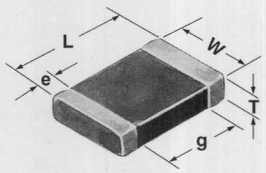


The GRH708-710 Series was designed specifically as an alternative to "cubic" chip capacitors in high-volume applications where low cost is a primary design objective.

FEATURES

- Miniature sizes
- Stable C0G temperature coefficient
- Very high Q at high frequencies
- High RF power handling capabilities
- Low noise

DIMENSIONS: in. (mm)



	★GRH708	★GRH710
L	.080 ± .012 (2.0 ± 0.3)	.125 ± .016 (3.2 ± 0.7)
W	.050 ± .012 (1.25 ± 0.03)	.100 ± .012 (2.5 ± 0.3)
T (max.)	.050 (1.25)	.060 (1.5)
g (min.)	.03 (0.7)	.04 (1.0)
e (min.)	.01 (0.25)	.012 (0.3)

SPECIFICATIONS

Operating Temperature Range	–55 to +125°C
Temperature Coefficient	0 ± 30ppm/°C
Working Voltage	See table, Page 23.
Dielectric Test Voltage (D.C.)	250% of rated working voltage (except 500 Volt rated @ 200%)
Capacitance Tolerance	C, D, G, J, K Available. Specials on request
Quality Factor (Q)/ESR	Consult your local Murata Electronics Sales Office for Q and ESR.
Insulation Resistance	@25°C: 1 to 470 pF: 1000K Megohms Min. over 470 pF: 100K Megohms Min. @125°C: 0.1 to 470 pF: 100K Megohms Min. over 470 pF: 10K Megohms Min.
Marking:	All capacitors are marked with Logo, Capacitance Code and Tolerance Code (where space permits) ink stamping or laser marking available

PART NUMBERING

GRH708 C0G 220 K 100 B L

CAPACITOR TYPE AND SIZE
GRH=Nickel Barrier layer solder. (Preferred)
GR=Palladium/Silver (Non-Preferred)

TEMPERATURE CHARACTERISTICS
Standard TC
C0G=0±30ppm/°C
–55°C to +125°C

CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

CAPACITANCE TOLERANCE
C0G: (10pF or less)
C=±.25pF
D=±.5pF

(Over 10pF)
G=±2%
J=±5%
K=±10%

VOLTAGE
Identified by a three-digit number.

MARKING
A=No Marking
B=EIA Marking
C=Non-standard

PACKAGING
B=Bulk
L=7" Reel

ENVIRONMENTAL

Aging:	Negligible
Environmental Tests:	MIL-STD-202
Shock:	Method 213, Condition J
Vibration:	Method 204, Condition B
Moisture Resistance:	Method 106
Solderability:	Method 208

Immersion:	Method 104, Condition B
Barometric Pressure:	Method 105, Condition B
Resistance to Soldering Heat:	Method 210, Condition B
Thermal Shock:	Method 107, Condition A
Life:	Method 108, Condition F

★Contact your local Murata Electronics Sales Office for specific standard values.

CAPACITANCE VALUES – GRH708

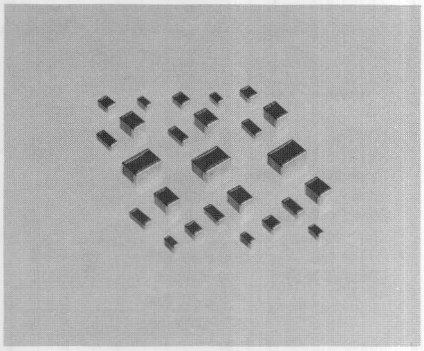
Cap. & Tol. in pF	Max ESR**	Rated VDC
*1.0 ± .25	0.142	200
1.1 ± .25	0.140	200
*1.2 ± .25	0.138	200
1.3 ± .25	0.136	200
1.4 ± .25	0.135	200
*1.5 ± .25	0.134	200
1.6 ± .25	0.133	200
1.7 ± .25	0.133	200
*1.8 ± .25	0.132	200
1.9 ± .25	0.132	200
2.0 ± .25	0.131	200
2.1 ± .25	0.130	200
*2.2 ± .25	0.129	200
2.4 ± .25	0.127	200
*2.7 ± .25	0.125	200
3.0 ± .25	0.123	200
*3.3 ± .25	0.121	200
3.6 ± .25	0.120	200
*3.9 ± .25	0.119	200
4.3 ± .25	0.117	200
4.7 ± .25	0.115	200
5.1 ± .25	0.113	200
*5.6 ± .50	0.111	200
6.2 ± .50	0.110	200
*6.8 ± .50	0.108	200
*7.5 ± .50	0.106	200
*8.2 ± .50	0.104	200
9.1 ± .50	0.102	200
*10 ± .50	0.100	200
11 ± 5%	0.098	200
*12 ± 5%	0.096	200
13 ± 5%	0.094	200
14 ± 5%	0.094	200
*15 ± 5%	0.092	200
16 ± 5%	0.090	200
*18 ± 5%	0.088	200
20 ± 5%	0.087	200
*22 ± 5%	0.085	200
25 ± 5%	0.083	200
24 ± 5%	0.084	200
*27 ± 5%	0.082	200
28 ± 5%	0.081	200
30 ± 5%	0.080	200
32 ± 5%	0.079	200
*33 ± 5%	0.079	200
34 ± 5%	0.078	200
36 ± 5%	0.077	200
*39 ± 5%	0.075	200
43 ± 5%	0.073	200
*47 ± 5%	0.071	200
51 ± 5%	0.070	200
*56 ± 5%	0.068	200
62 ± 5%	0.067	200
*68 ± 5%	0.065	200
75 ± 5%	0.063	200
*82 ± 5%	0.062	200
91 ± 5%	0.060	200
* 100 ± 5%	0.058	200
110 ± 5%	0.057	100
* 120 ± 5%	0.057	100
130 ± 5%	0.056	100
140 ± 5%	0.056	100
* 150 ± 5%	0.056	50
160 ± 5%	0.055	50

*Available as standard through authorized Murata Electronics Distributors.
**Max ESR measured at ¼ wavelength on Booton 34A

GRH710

Cap. & Tol. in pF	Max ESR**	Rated VDC
*3.3 ± .25	0.121	500
3.6 ± .25	0.120	500
*3.9 ± .25	0.119	500
4.3 ± .25	0.117	500
*4.7 ± .25	0.115	500
5.1 ± .25	0.113	500
*5.6 ± .50	0.111	500
6.2 ± .50	0.110	500
*6.8 ± .50	0.108	500
7.5 ± .50	0.106	500
*8.2 ± .50	0.104	500
9.1 ± .50	0.102	500
*10 ± .50	0.100	500
11 ± 5%	0.098	500
*12 ± 5%	0.096	500
13 ± 5%	0.094	500
14 ± 5%	0.094	500
*15 ± 5%	0.092	500
16 ± 5%	0.090	500
*18 ± 5%	0.088	500
20 ± 5%	0.087	500
*22 ± 5%	0.085	500
25 ± 5%	0.083	500
24 ± 5%	0.084	500
*27 ± 5%	0.082	500
28 ± 5%	0.081	500
30 ± 5%	0.080	500
32 ± 5%	0.079	500
*33 ± 5%	0.079	500
34 ± 5%	0.078	500
36 ± 5%	0.077	500
*39 ± 5%	0.075	500
*43 ± 5%	0.073	500
*47 ± 5%	0.071	500
51 ± 5%	0.070	500
*56 ± 5%	0.068	500
62 ± 5%	0.067	500
*68 ± 5%	0.065	500
75 ± 5%	0.063	500
*82 ± 5%	0.062	500
91 ± 5%	0.060	500
* 100 ± 5%	0.058	500
110 ± 5%	0.057	500
* 120 ± 5%	0.057	500
130 ± 5%	0.056	300
140 ± 5%	0.056	300
* 150 ± 5%	0.056	300
160 ± 5%	0.055	200
* 180 ± 5%	0.055	200
200 ± 5%	0.055	200
* 220 ± 5%	0.055	200
240 ± 5%	0.055	100
* 270 ± 5%	0.055	100
300 ± 5%	0.055	100
* 330 ± 5%	0.055	100
360 ± 5%	0.055	100
* 390 ± 5%	0.055	100
430 ± 5%	0.055	100
* 470 ± 5%	0.055	100
510 ± 5%	0.055	50
620 ± 5%	0.055	50
* 820 ± 5%	0.055	50
910 ± 5%	0.055	50
* 1000 ± 5%	0.055	50

500 AND 1000 VOLT RATED MLC CHIP CAPACITORS GRM SERIES



These new surface mount components are designed to meet the growing demand for miniature, reliable chip capacitors, especially where high volume automation is required. Applications include solid state relays, telecom, instrumentation, modems, computer peripherals, and others.

FEATURES

- Standard E.I.A. sizes
- Up to 2 X rated voltage tested
- −55°C to +125°C rated

BENEFITS

- Compatible with SMT equipment
- Improves long term reliability
- Suitable for harsh environments

C0G

*EIA PREFERRED SIZE

MURATA DESIGNATION		GRM42-6*		GRM42-2*		GRM43		GRM43-2*		GRM43-4*		GRM44-1		GRM44	
EIA TYPE DESIGNATION		1206		1210		1808		1812		1825		2220		2225	
DIMENSIONS: in. (mm)	L	.125±.008 (3.2±0.2)		.125±.008 (3.2±0.2)		.180±.012 (4.6±0.3)		.180±.012 (4.6±0.3)		.180±.012 (4.6±0.3)		.220±.012 (5.6±0.3)		.220±.012 (5.6±0.3)	
	W	.060±.008 (1.5±0.2)		.100±.008 (2.5±0.2)		.080±.008 (2.0±0.2)		.125±.008 (3.2±0.2)		.250±.016 (6.35±0.4)		.200+.010/−.020 (5.1+0.25/−0.5)		.250±.016 (6.35±0.4)	
	T max	.065 (1.5)		.100 (1.9)		.100 (1.9)		.110 (2.8)		.110 (2.8)		.110 (2.8)		.110 (2.8)	
	g min.	.040 (1.0)		.040 (1.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)	
	e	.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)	
WVDC		500	1000	500	1000	500	1000	500	1000	500	1000	500	1000	500	1000
Capacitance	(pF) 1.0														
	1.2														
	1.5														
	1.8														
	2.2														
	2.7														
	3.3	3.5													
	3.9														
	4.7														
	5.6														
	6.8														
	8.2						10								
	10														
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	33														
	39														
	47														
	56														
	68														
	82			100					100						
	100														
	120														
	150														
	180					180									
	220														
	270						270	330			330		330		
	330														390
	390														
	470	470													
	560								560						
	680														
	820									1000		1000		1000	
	1000			1000											
	1200					1200									
	1500										1500		1500		
	1800														1800
	2200														
	2700							2700							
	3300														
	3900														
	4700														
	5600														
	6800									6800		7500			
	8200													8200	
	(μF) .01														
	.012														
	.015														
	.022														
	.027														
	.033														
	.039														
	.047														
	.056														
	.068														
	.082														
	.1														
	.12														
	.15														
	.18														
	.22														
	.27														
	.33														
	.39														
	.47														
	.56														

*Contact your local Murata Electronics Sales Office for specific standard values.

PART NUMBERING SYSTEM

GRM 42-2 -- X7R 103 K 500 A L

CAPACITOR TYPE AND SIZE
GRM — Nickel Barrier/Plated Tin (Standard)
GR — Palladium-Silver (Non-preferred)

2 or 3 digit code appears as necessary to indicate special thickness requirements. Please consult factory for details.

TEMPERATURE CHARACTERISTIC
Standard TC's
C0G=0±30ppm
X7R=±15%

CAPACITANCE VALUE
Identified by a three-digit code. First two digits represent significant figures. Last digit specifies the number of zeros to follow. For fractional values below 10pF, the letter "R" is used as the decimal point and the last digit becomes significant.

CAPACITANCE TOLERANCE
C0G:
(10pF or less).
C=±.25pF
D=±.5pF
(Over 10pF)
F=±1%
G=±2%
J=±5%
K=±10%
X7R:
K=±10%
M=±20%
J=±5% on special request

VOLTAGE
Identified by a three-digit number. Others available upon request. (1,000 volts coded as 1KV)

MARKING
A=Unmarked
B=EIA Marking
C=Non-standard Marking

PACKAGING

Reel Diameter/ Tape Material	EIA-481-A Standard
7″ Plastic Tape	L
13″ Plastic Tape	K
Bulk	B

Some values cannot be taped
Consult factory for additional marking and packaging information.

X7R

***EIA PREFERRED SIZE**

MURATA DESIGNATION		GRM42-6*		GRM42-2*		GRM43*		GRM43-2*		GRM43-4*		GRM44-1		GRM44	
EIA TYPE DESIGNATION		1206		1210		1808		1812		1825		2220		2225	
DIMENSIONS: in. (mm)	L	.125±.008 (3.2±0.2)		.125±.008 (3.2±0.2)		.180±.012 (4.6±0.3)		.180±.012 (4.6±0.3)		.180±.012 (4.6±0.3)		.220±.012 (5.6±0.3)		.220±.012 (5.6±0.3)	
	W	.060±.008 (1.5±0.2)		.100±.008 (2.5±0.2)		.080±.008 (2.0±0.2)		.125±.008 (3.2±0.2)		.250±.016 (6.35±0.4)		.200+.010/−.020 (5.1+0.25/−0.5)		.250±.016 (6.35±0.4)	
	T max	.065 (1.5)		.100 (1.9)		.100 (1.9)		.110 (2.8)		.110 (2.8)		.110 (2.8)		.110 (2.8)	
	g min.	.040 (1.0)		.040 (1.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)		.080 (2.0)	
	e	.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)		.020±.010 (0.5±0.25)	
WVDC		500	1000	500	1000	500	1000	500	1000	500	1000	500	1000	500	1000
Capacitance	(pF) 1.0														
	1.2														
	1.5														
	1.8														
	2.2														
	2.7														
	3.3														
	3.9														
	4.7														
	5.6														
	6.8														
	8.2														
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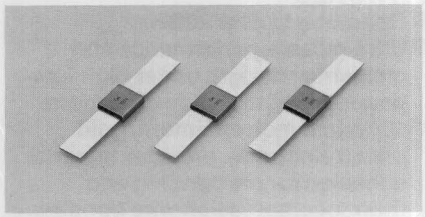
	56														
	68														
	82														
	100														
	120														
	150														
	180														
	220														
	270														
	330														
	390	390													
	470														
	560														
	680														
	820			1000			820		1000						
	1000														
	1200														
	1500														
	1800														
	2200														
	2700														
	3300														
	3900						3900								
	4700														
	5600														
	6800					6800									
	8200	6800						.01			.01		.01		.01
	(μF) .01														
	.012								.01						
	.015			.015						.022					
	.022					.020					.022	.027		.033	
	.027												.027		.033
	.033														
	.039														
	.047							.047							
	.056														
	.068														
	.082														
	.1									.10					
	.12											.12			
	.15													.15	
	.18														
	.22														
	.27														
	.33														
	.39														
	.47														
	.56														

*Contact your local Murata Electronics Sales Office for specific standard values.

GLASS ENCAPSULATED MINIATURE RF POWER MULTILAYER CAPACITORS



Miniature UFP fixed ceramic capacitors are specifically designed for high voltage and high RF current high frequency applications. They are ideally suited to the latest aerospace and commercial mobile and fixed communication equipment.

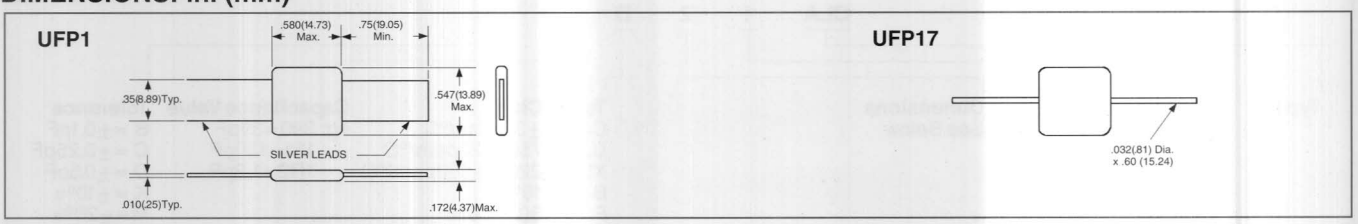
Glass encapsulation protects UFP capacitors against corona, contaminants and other environmental factors. Wide, fine silver lead terminations assure minimum inductance and high RF current capabilities. They can withstand temperatures far in excess of soldered units due to solderless lead attachment.

PART NUMBERING SYSTEM

UFP 1 7 15 1 K

- **UFP** — **UFP**
- **CASE SIZE** — **1**
- **TERMINATION** — **7**
  Blank = Ribbon
  7 = Wire
- **CAPACITANCE CODE** — **15**
  First two digits of Capacitance Value in pF
  Note: R signifies decimal point
- **NO. OF ZEROES** — **1**
  Following the first two digits of the capacitance value in pF
- **CAPACITANCE TOLERANCE** — **K**
  J = ±5% (standard)
  K = ±10% (standard)
  Other tolerances are available, contact factory.

DIMENSIONS: in. (mm)



SPECIFICATIONS

Current: 8 amperes at 25°C (Derated for higher temperatures)
Q: 5,000 min. at 1 MHz and 25°C for values 1,000pF and smaller
Tolerances: ±0.5pF for values below 10pF
±5%, ±10% for higher values

*NPOC T.C. also available. Consult your local Murata Electronics Sales Office.

Power: 12 KVAR at 25°C typical
Voltage: See chart below
***Temperature Coefficient:** +90, ±20ppm/°C at 1 MHz (–55°C to +125°C)
Testing: RF tested to rated specifications
Marking: All capacitors stamp marked with company I.D., cap. code and tolerance

Models	Range of Values (pF)	WVDC	Test Voltage DC	RF Current Amps. RMS at +25°C	RF Voltage RMS at +25°C	KVAR* Rating at +25°C	Voltage Limiting Impedance (ohms)	Current Limiting Impedance (ohms)
UFP1	10 to 150	3,600	7,000	8	3,000	12	750	187.5
	160 to 330	2,500	4,500	8	2,000	12	333.3	187.5
	360 to 620	1,200	2,400	8	1,000	6	166.7	93.75
	680 to 1,300	600	1,200	8	500	3	83.3	46.88
	1,500 to 3,000	300	600	8	250	1.5	41.67	23.44

*NOTE
1. When the impedance of the capacitor is higher than the value shown, the limiting factor is the RF voltage shown.
2. When the impedance of the capacitor is below the value shown, the limiting factor is the RF current shown.
3. Between these two impedance limits, the KVAR rating is the limiting factor. Formulas for voltage and current are:

$$V = (1{,}000 \times KVAR \times IMPEDANCE)^{1/2} \qquad I = \left(\frac{1{,}000 \times KVAR}{IMPEDANCE}\right)^{1/2}$$

4. RF current rating derates 0.4%/°C from +25°C rating at all higher temperatures to +125°C.
5. KVAR rating derates 0.5%/°C from +25°C rating at all higher temperatures to +125°C.
6. RF voltage derates 0.16%/°C from +25°C rating at all higher temperatures to +125°C.

PREFERRED VALUES

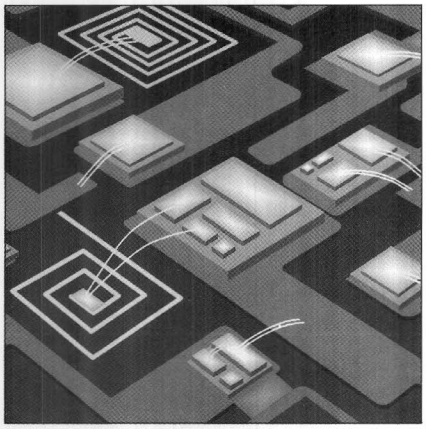
Case Code	Cap.pF	Cap. Code	Tol.
UFP1	10	100★	J,K
	11	110	J,K
	12	120★	J,K
	13	130★	J,K
	15	150★	J,K
	16	160	J,K
	18	180★	J,K
	20	200★	J,K
	22	220★	J,K
	24	240★	J,K
	27	270★	J,K
	30	300★	J,K
	33	330★	J,K
	36	360★	J,K
	39	390★	J,K
	43	430	J,K
	47	470★	J,K
	51	510	J,K
	56	560★	J,K
	62	620	J,K
	68	680★	J,K
	75	750★	J,K

Case Code	Cap.pF	Cap. Code	Tol.
UFP1	82	820	J,K
	91	910★	J,K
	100	101★	J,K
	110	111	J,K
	120	121★	J,K
	130	131★	J,K
	150	151★	J,K
	160	161	J,K
	180	181★	J,K
	200	201★	J,K
	220	221★	J,K
	240	241	J,K
	270	271★	J,K
	300	301★	J,K
	330	331★	J,K
	360	361	J,K
	390	391★	J,K
	430	431	J,K
	470	471★	J,K
	510	511	J,K
	560	561	J,K
	620	621	J,K

Case Code	Cap.pF	Cap. Code	Tol.
UFP1	680	681	J,K
	750	751	J,K
	820	821	J,K
	910	911★	J,K
	1,000	102★	J,K
	1,100	112	J,K
	1,200	122	J,K
	1,300	132	J,K
	1,500	152	J,K
	1,600	162	J,K
	1,800	182	J,K
	2,000	202	J,K
	2,200	222	J,K
	2,400	242	J,K
	2,700	272	J,K
	3,000	302	J,K

★Available as standard through authorized Murata Electronics Distributors: J Tol.

CLA Series
SINGLE LAYER CERAMIC CAPACITORS FOR MICROWAVE INTEGRATED CIRCUITS



The CLA series of capacitors has been developed to meet the demand for a high reliability capacitor with the ability to withstand high voltages in microwave applications. They are a result of the development of a high density ceramic material and state-of-the-art thin film technology. With CLA single and multi-plate ultra-miniature capacitors, manufacturers of microwave products can improve both production yield and quality. The multi-plate series provides the option of using a single device for varied capacitance requirements, effectively minimizing material preparation while reducing time and cost.

FEATURES

- **Operation to over 20GHz.**
- **Ultra-reliable performance and dielectric strength under high temperature and moisture conditions.**
- **100 micro inch minimum, gold plated electrode, provides superior adhesion for die bonding and thermocompression wire bonding.**
- **Safety margin around plate areas eliminates the possibility of electrical shorts.**
- **Multi-plate designs (binary-segmented capacitance values on one chip) provide a variety of capacitance values for fine tuning.**

PART NUMBERING

CLA 1 2 B 390 K

Type

Number of electrodes
1
3
4
5

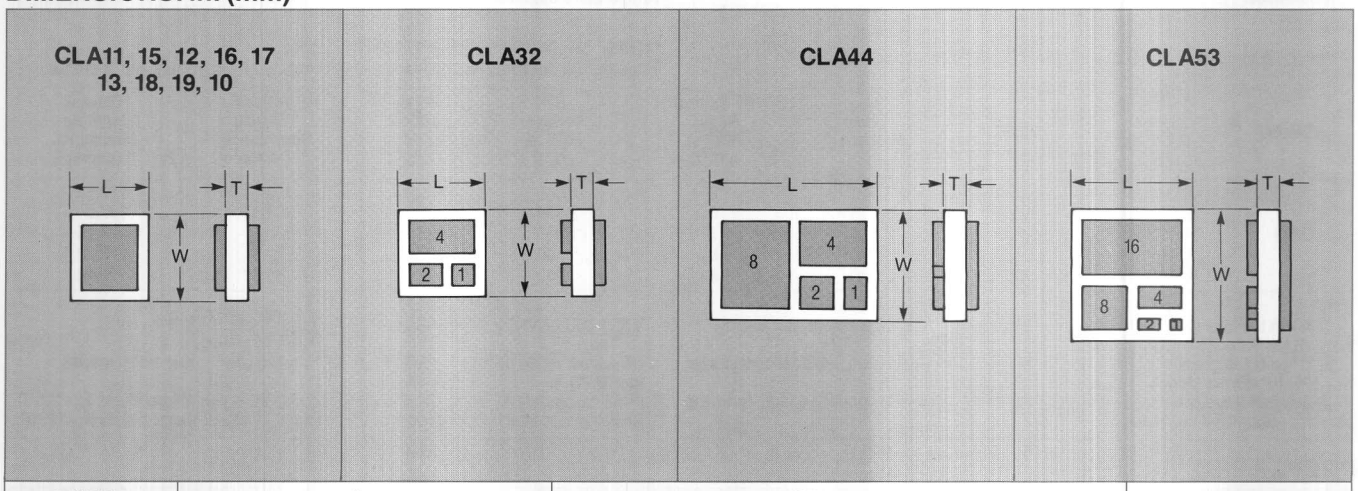
Dimensions
See Below

Temp. Char.
CG : 0 ±30 ppm/°C
UJ : −750±120ppm/°C
XL : −2200 ±500ppm/°C
B : ±10%
F : +30, −80%
(−25°C to +85°C)

Capacitance Value
eg: 390=39pF
131=130pF
1R2=1.2pF

Tolerance
B =±0.1pF
C =±0.25pF
D =±0.5pF
K =±10%
M=±20%

DIMENSIONS: in. (mm)



TYPE	L	W	T Max.
CLA11	0.010 (0.25) ± 0.002 (0.05)	0.010 (0.25) ± 0.005 (0.13)	0.007 (0.18)
15	0.015 (0.38) ± 0.002 (0.05)	0.015 (0.38) + 0.015 (0.38), − 0.005 (0.13)	0.008 (0.2)
12	0.020 (0.51) ± 0.002 (0.05)	0.020 (0.51) ± 0.01 (0.25)	0.010 (0.25)
16	0.025 (0.64) ± 0.002 (0.05)	0.025 (0.64) + 0.02 (0.51), − 0.01 (0.25)	0.010 (0.25)
17	0.030 (0.76) ± 0.002 (0.05)	0.030 (0.76) ± 0.015 (0.38)	0.010 (0.25)
13	0.035 (0.90) ± 0.002 (0.05)	0.035 (0.90) + 0.025 (0.64), − 0.015 (0.38)	0.010 (0.25)
18	0.050 (1.27) ± 0.004 (0.10)	0.050 (1.27) + 0.04 (1.02), − 0.02 (0.51)	0.010 (0.25)
19	0.070 (1.78) ± 0.004 (0.10)	0.070 (1.78) + 0.05 (1.27), − 0.03 (0.76)	0.012 (0.3)
10	0.090 (2.29) ± 0.004 (0.10)	0.090 (2.29) + 0.06 (1.52), − 0.04 (1.02)	0.014 (0.35)
32	0.020 (0.51) ± 0.002 (0.05)	0.020 (0.51) ± 0.002 (0.05)	0.010 (0.25)
44	0.035 (0.90) ± 0.002 (0.05)	0.020 (0.51) ± 0.002 (0.05)	0.010 (0.25)
53	0.035 (0.90) ± 0.002 (0.05)	0.035 (0.90) ± 0.002 (0.05)	0.010 (0.25)

CAPACITANCE RANGE

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SINGLE ELECTRODE

Type		CG	UJ	XL	B	F
CLA11	Cap. Range	0.1-0.2	0.3-0.9	0.6-1.8	1.5-18	20-51
	Tolerance	B,C,D,K	B,C,D,K	B,C,D	C,D,K	K,M
CLA15	Cap. Range	0.2-0.8	0.9- 2.7	1.8-5.6	3.6-56	47-150
	Tolerance	B,C,D	C,D	C,D	D,K,M	K,M
CLA12	Cap. Range	0.3-1.0	1.0- 3.6	2.0-6.2	4.3-68	56-200
	Tolerance	B,C,D	C,D,K	C,D,K	K,M	M
CLA16	Cap. Range	0.3-1.6	2.0- 6.2	3.6-11	7.5-120	100-360
	Tolerance	B,C,D	D,K	D	K,M	M
CLA17	Cap. Range	0.4-2.0	2.7- 7.5	5.6-15	13-130	150-390
	Tolerance	B,C,D	D,K	D,K	K,M	M
CLA13	Cap. Range	0.5-2.7	3.0- 9.1	6.2-18	13-180	160-560
	Tolerance	B,C,D	D,K	K	K,M	M
CLA18	Cap. Range	1.0-5.6	7.5-20	15-39	30-390	330-1300
	Tolerance	C,D	K	K,M	K,M	M
CLA19	Cap. Range	1.8-10.0	13-39	27-75	56-750	680-1800
	Tolerance	C,D,K	K,M	K,M	K,M	M
CLA10	Cap. Range	3.0-16	20-62	39-120	82-1200	1200-3000
	Tolerance	D,K	K,M	K,M	K,M	M

NOTE 1: All Capacitance values in pF
NOTE 2: Capacitance values available within the ranges shown above are in EIA E24 steps as denoted below.

MULTI-ELECTRODE

Part Number	Cap. Value (Largest plate) pF
CLA32UJ0R7K	0.7
CLA32XL1R5K	1.5
CLA44UJ1R5K	1.5
CLA44XL3R0K	3.0
CLA53UJ3R0K	3.0
CLA53XL5R9K	5.9

E24 STEP

1.0	3.3
1.1	3.6
1.2	3.9
1.3	4.3
1.5	4.7
1.6	5.1
1.8	5.6
2.0	6.2
2.2	6.8
2.4	7.5
2.7	8.2
3.0	9.1

TOLERANCE

B: ±0.1 pF
C: ±0.25pF
D: ±0.5 pF
K: ±10%
M: ±20%

TEMPERATURE CHARACTERISTICS

CG: 0 ± 30ppm/°C
UJ: −750 ± 120ppm/°C
XL: −2200 ± 500ppm/°C
B: ± 10%
F: +30, −80%
(−25°C to +85°C)

MINIATURE MEDIUM VOLTAGE CERAMIC DISC CAPACITORS E.I.A. CLASS I, II & III

1-6K VDC

PART NUMBERING SYSTEM

DE04	05	B	101	K	1KV
CAPACITOR TYPE AND SIZE	**LEAD SPACING** 05=.197 (5) 07=.300 (7.5) 10=.394 (10)	**TEMPERATURE CHARACTERISTICS** **TEMPERATURE RANGE:**–25°C~+85°C **MAX. CAP. CHANGE OVER TEMP. RANGE** **Class I =** P350 through N1000 (SL) B= ± 10% E= +20, –55% F= +30, –80%	**CAPACITANCE VALUE**	**CAPACITANCE TOLERANCE** J= ± 5% K= ± 10% Z= +80, –20%	**VOLTAGE** Identified by a one-digit number.

1KV – SL

All values standard through Murata Electronics Distributors.

PART NUMBER	DIA (mm)	LS (mm)	CAP (pF)
DE0405SL100D1KV	4	5	10
DE0405SL120J1KV	4	5	12
DE0405SL150J1KV	4	5	15
DE0405SL180J1KV	4	5	18
DE0405SL220J1KV	4	5	22
DE0405SL270J1KV	4	5	27
DE0405SL330J1KV	4	5	33
DE0405SL390J1KV	4	5	39
DE0405SL470J1KV	4	5	47
DE0505SL560J1KV	5	5	56
DE0505SL680J1KV	5	5	68
DE0605SL820J1KV	6	5	82
DE0605SL101J1KV	6	5	100
DE0605SL121J1KV	6	5	120
DE0705SL151J1KV	7	5	150
DE0705SL181J1KV	7	5	180
DE0805SL221J1KV	8	5	220
DE0905SL271J1KV	9	5	270
DE1005SL331J1KV	10	5	330
DE1005SL391J1KV	10	5	390
DE1105SL471J1KV	11	5	470
DE1205SL561J1KV	12	5	560

2KV – SL

DE0405SL100D2KV	4	5	10
DE0405SL120J2KV	4	5	12
DE0405SL150J2KV	4	5	15
DE0405SL180J2KV	4	5	18
DE0405SL220J2KV	4	5	22
DE0405SL270J2KV	4	5	27
DE0405SL330J2KV	4	5	33
DE0505SL390J2KV	5	5	39
DE0605SL470J2KV	6	5	47
DE0605SL560J2KV	6	5	56
DE0605SL680J2KV	6	5	68
DE0705SL820J2KV	7	5	82
DE0705SL101J2KV	7	5	100
DE0805SL121J2KV	8	5	120
DE0805SL151J2KV	8	5	150
DE0905SL181J2KV	9	5	180
DE1005SL221J2KV	10	5	220
DE1105SL271J2KV	11	5	270
DE1205SL331J2KV	12	5	330
DE1307SL391J2KV	13	7	390
DE1410SL471J2KV	14	10	470
DE1510SL561J2KV	15	10	560

3KV – SL

DE0507SL100D3KV	5	7	10
DE0507SL120J3KV	5	7	12
DE0507SL150J3KV	5	7	15
DE0507SL180J3KV	5	7	18
DE0507SL220J3KV	5	7	22
DE0607SL270J3KV	6	7	27
DE0607SL330J3KV	6	7	33
DE0607SL390J3KV	6	7	39
DE0707SL470J3KV	7	7	47
DE0707SL560J3KV	7	7	56
DE0807SL680J3KV	8	7	68
DE0807SL820J3KV	8	7	82
DE0907SL101J3KV	9	7	100
DE1007SL121J3KV	10	7	120
DE1107SL151J3KV	11	7	150
DE1107SL181J3KV	11	7	180
DE1207SL221J3KV	12	7	220
DE1410SL271J3KV	14	10	270
DE1510SL331J3KV	15	10	330
DE1610SL391J3KV	16	10	390

MINIATURE MEDIUM VOLTAGE CERAMIC DISC CAPACITORS E.I.A. CLASS I, II & III

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1-6K VDC

6KV – SL All values standard through Murata Electronics Distributors.

PART NUMBER	DIA (mm)	LS (mm)	CAP (pF)
DE0910SL220J6KV	9	10	22
DE0910SL270J6KV	9	10	27
DE0910SL330J6KV	9	10	33
DE0910SL390J6KV	9	10	39
DE0910SL470J6KV	9	10	47
DE1010SL560J6KV	10	10	56
DE1210SL680J6KV	12	10	68
DE1210SL820J6KV	12	10	82
DE1310SL101J6KV	13	10	100
DE1410SL121J6KV	14	10	120
DE1510SL151J6KV	15	10	150

1KV – B

DE0405B101K1KV	4	5	100
DE0405B151K1KV	4	5	150
DE0405B221K1KV	4	5	220
DE0405B331K1KV	4	5	330
DE0505B471K1KV	5	5	470
DE0605B681K1KV	6	5	680
DE0605B102K1KV	6	5	1000
DE0805B152K1KV	8	5	1500
DE0905B222K1KV	9	5	2200
DE1005B332K1KV	10	5	3300
DE1205B472K1KV	12	5	4700
DE1510B682K1KV	15	10	6800

2KV – B

DE0405B101K2KV	4	5	100
DE0405B151K2KV	4	5	150
DE0405B221K2KV	4	5	220
DE0505B331K2KV	5	5	330
DE0605B471K2KV	6	5	470
DE0705B681K2KV	7	5	680
DE0805B102K2KV	8	5	1000
DE0905B152K2KV	9	5	1500
DE1005B222K2KV	10	5	2200
DE1205B332K2KV	12	5	3300
DE1510B472K2KV	15	10	4700

3KV – B

DE0507B101K3KV	5	7	100
DE0507B151K3KV	5	7	150
DE0507B221K3KV	5	7	220
DE0607B331K3KV	6	7	330
DE0707B471K3KV	7	7	470
DE0807B681K3KV	8	7	680
DE0907B102K3KV	9	7	1000
DE1107B152K3KV	11	7	1500
DE1307B222K3KV	13	7	2200
DE1510B332K3KV	15	10	3300

6KV – B

DE0910B101K6KV	9	10	100
DE0910B151K6KV	9	10	150
DE0910B221K6KV	9	10	220
DE0910B331K6KV	9	10	330
DE1010B471K6KV	10	10	470
DE1110B681K6KV	11	10	680
DE1310B102K6KV	13	10	1000

1KV – E

DE0505E102Z1KV	5	5	1000
DE0705E222Z1KV	7	5	2200
DE0905E472Z1KV	9	5	4700
DE1307E103Z1KV	13	7	10000

2KV – E

DE0605E102Z2KV	6	5	1000
DE0805E222Z2KV	8	5	2200
DE1105E472Z2KV	11	5	4700
DE1610E103Z2KV	16	10	10000

3KV – E

DE0705E102Z3KV	7	7	1000
DE1007E222Z3KV	10	7	2200
DE1307E472Z3KV	13	7	4700

6KV – E

DE1110E102Z6KV	11	10	1000
DE1510E222Z6KV	15	10	2200

MINIATURE MEDIUM VOLTAGE CERAMIC DISC CAPACITORS E.I.A. CLASS I, II & III

1-6K VDC

1KV – F All values standard through Murata Electronics Distributors.

PART NUMBER	DIA (mm)	LS (mm)	CAP (pF)
DE0605F222Z1KV	6	5	2200
DE0705F472Z1KV	7	5	4700
DE1005F103Z1KV	10	5	10000

2KV – F

DE0505F102Z2KV	5	5	1000
DE0705F222Z2KV	7	5	2200
DE0905F472Z2KV	9	5	4700
DE1205F103Z2KV	12	5	10000

HR SERIES, HIGH TEMPERATURE (+125°)/ LOW LOSS .3% DISSIPATION FACTOR E.I.A. CLASS I & II

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250 - 6K VDC

PART NUMBERING SYSTEM

DE07 — **CAPACITOR TYPE AND SIZE**

05 — **LEAD SPACING**
5, 05 = .197 (5)
7, 07 = .300 (7.5)
0, 10 = .394 (10)
16 = .630 (16)

R — **TEMPERATURE CHARACTERISTICS**
–25°C to +125°C
MAX. CAP. CHANGE OVER TEMP. RANGE
SL= +350-1000ppm/°C

	–25°C to +85°C	+85°C to +125°C
R=	±15%	+15, –30%
C=	±20%	+15, –30%

221 — **CAPACITANCE VALUE**
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

K — **CAPACITANCE TOLERANCE**
J = ± 5% (Class I only)
K= ± 10%

1KV — **VOLTAGE**
Identified by a one, two or three digit number.

250V – R

All values standard through Murata Electronics Distributors.

PART NUMBER	DIA (mm)	LS (mm)	CAP (pF)
DE50–6R221K250V	6	5	220
DE50–6R331K250V	6	5	330
DE50–6R471K250V	6	5	470
DE50–6R681K250V	6	5	680
DE50–6R102K250V	6	5	1000
DE50–7R152K250V	7	5	1500
DE50–8R222K250V	8	5	2200
DE50–9R332K250V	9	5	3300
DE51–0R472K250V	10	5	4700
DE51–2R682K250V	12	5	6800
DE51–2R103K250V	12	5	10000

500V – C

DE50–6C331K500V	6	5	330
DE50–6C471K500V	6	5	470
DE50–7C681K500V	7	5	680
DE50–8C102K500V	8	5	1000
DE50–9C152K500V	9	5	1500
DE51–0C222K500V	10	5	2200
DE51–2C332K500V	12	5	3300
DE51–4C472K500V	14	10	4700

1KV – R

DE0705R221K1KV	7	5	220
DE0705R331K1KV	7	5	330
DE0705R471K1KV	7	5	470
DE0805R681K1KV	8	5	680
DE0905R102K1KV	9	5	1000
DE1105R152K1KV	11	5	1500
DE1310R222K1KV	13	10	2200
DE1510R332K1KV	15	10	3300
DE1710R472K1KV	17	10	4700

2KV – R

DE0707R221K2KV	7	7	220
DE0707R271K2KV	7	7	270
DE0807R331K2KV	8	7	330
DE0807R391K2KV	8	7	390
DE0907R471K2KV	9	7	470
DE0907R561K2KV	9	7	560
DE1007R681K2KV	10	7	680
DE1107R821K2KV	11	7	820
DE1207R102K2KV	12	7	1000
DE1207R122K2KV	12	7	1200
DE1207R152K2KV	12	7	1500
DE1410R182K2KV	14	10	1800
DE1510R222K2KV	15	10	2200
DE1710R272K2KV	17	10	2700
DE1910R332K2KV	19	10	3300
DE2010R392K2KV	20	10	3900
DE2110R472K2KV	21	10	4700

3KV – R

DE0707R101K3KV	7	7	100
DE0707R151K3KV	7	7	150

HR SERIES, HIGH TEMPERATURE (+125°)/ LOW LOSS .3% DISSIPATION FACTOR
E.I.A. CLASS I & II

250 - 6K VDC

3KV – R All values standard through Murata Electronics Distributors.

PART NUMBER	DIA (mm)	LS (mm)	CAP (pF)
DE0707R181K3KV	7	7	180
DE0707R221K3KV	7	7	220
DE0707R271K3KV	7	7	270
DE0807R331K3KV	8	7	330
DE0907R391K3KV	9	7	390
DE1007R471K3KV	10	7	470
DE1007R561K3KV	10	7	560
DE1107R681K3KV	11	7	680
DE1207R821K3KV	12	7	820
DE1310R102K3KV	13	10	1000
DE1410R122K3KV	14	10	1200
DE1510R152K3KV	15	10	1500
DE1610R182K3KV	16	10	1800
DE1710R222K3KV	17	10	2200
DE1910R272K3KV	19	10	2700

6KV – R

DE0915R221K6KV	9	10	220
DE1010R331K6KV	10	10	330
DE1210R471K6KV	12	10	470
DE1310R681K6KV	13	10	680
DE1716R102K6KV	17	16	1000
DE1916R152K6KV	19	16	1500
DE2116R222K6KV	21	16	2200

1KV – SL

DE507–5SL100D1KV	7	5	10
DE507–5SL120J1KV	7	5	12
DE507–5SL150J1KV	7	5	15
DE507–5SL180J1KV	7	5	18
DE507–5SL220J1KV	7	5	22
DE507–5SL270J1KV	7	5	27
DE507–5SL330J1KV	7	5	33
DE507–5SL390J1KV	7	5	39
DE507–5SL470J1KV	7	5	47
DE507–5SL560J1KV	7	5	56
DE507–5SL680J1KV	7	5	68
DE507–5SL820J1KV	7	5	82
DE507–5SL101J1KV	7	5	100
DE507–5SL121J1KV	7	5	120
DE508–5SL151J1KV	8	5	150
DE508–5SL181J1KV	8	5	180
DE509–5SL221J1KV	9	5	220
DE510–5SL271J1KV	10	5	270
DE511–5SL331J1KV	11	5	330

2KV – SL

DE507–7SL100D2KV	7	7	10
DE507–7SL120J2KV	7	7	12
DE507–7SL150J2KV	7	7	15
DE507–7SL180J2KV	7	7	18
DE507–7SL220J2KV	7	7	22
DE507–7SL270J2KV	7	7	27
DE507–7SL330J2KV	7	7	33
DE507–7SL390J2KV	7	7	39
DE507–7SL470J2KV	7	7	47
DE507–7SL560J2KV	7	7	56
DE507–7SL680J2KV	7	7	68
DE507–7SL820J2KV	7	7	82
DE508–7SL101J2KV	8	7	100
DE508–7SL121J2KV	8	7	120
DE509–7SL151J2KV	9	7	150
DE510–7SL181J2KV	10	7	180
DE511–7SL221J2KV	11	7	220

3KV – SL

DE507–7SL100D3KV	7	7	10
DE507–7SL120J3KV	7	7	12
DE507–7SL150J3KV	7	7	15
DE507–7SL180J3KV	7	7	18
DE507–7SL220J3KV	7	7	22
DE507–7SL270J3KV	7	7	27
DE507–7SL330J3KV	7	7	33
DE507–7SL390J3KV	7	7	39
DE507–7SL470J3KV	7	7	47
DE508–7SL560J3KV	8	7	56
DE508–7SL680J3KV	8	7	68
DE509–7SL820J3KV	9	7	82
DE510–7SL101J3KV	10	7	100
DE511–7SL121J3KV	11	7	120

SAFETY RECOGNIZED
CERAMIC DISC CAPACITORS

PART NUMBERING SYSTEM

DE7150 FZ 103 P VA1 KC/MY

CAPACITOR TYPE AND SIZE

TEMPERATURE CHARACTERISTICS
Temperature range
B = –25°C to +85°C
F = –25°C to +85°C
FZ = –10°C to +60°C
MAX. CAP. CHANGE OVER TEMP. RANGE
B = ±10%
F = +30%, –80%
FZ= +30%, –85%

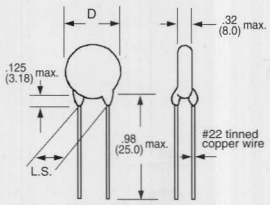
CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

CAPACITANCE TOLERANCE
K = ±10%
M = ±20%
P = +100, –0%

VOLTAGE
VA1=400 VAC : Europe
250 VAC : North America & Europe (VDE565-1/UL1414)
125 VAC : North America
AC125=125 VAC : North America Only

LISTED TYPE DESIGNATION

SPECIFICATIONS



Part Number	DIMENSIONS: in. (mm) D max.	DIMENSIONS: in. (mm) L.S.	CAPACITANCE (pF)
★DE7090 B 101K VA1-KC	.394 (10)	.300 (7.5)	100
★DE7090 B 151K VA1-KC	.394 (10)	.300 (7.5)	150
★DE7090 B 221K VA1-KC	.394 (10)	.300 (7.5)	220
★DE7090 B 331K VA1-KC	.394 (10)	.300 (7.5)	330
★DE7090 B 471K VA1-KC	.394 (10)	.300 (7.5)	470
★DE7090 B 681K AC125-MY	.394 (10)	.300 (7.5)	680
★DE7090 B 102K VA1-KC	.394 (10)	.300 (7.5)	1000
★DE7100 F 222M VA1-KC	.472 (12)	.300 (7.5)	2200
★DE7100 FZ 472P VA1-KC	.472 (12)	.300 (7.5)	4700
★DE7120 F 332M VA1-KC	.551 (14)	.394 (10)	3300
★DE7150 F 472M VA1-KC	.669 (17)	.394 (10)	4700
★DE7150 FZ 103P VA1-KC	.669 (17)	.394 (10)	10,000
★DE7150 F 103M VA1-KC	.669 (17)	.394 (10)	10,000

TYPE KC

	Recognized Standard No.																	
	VIDE0560-3 BS415 AS3250	VDE0565-1 — —		SEV1055/SEV1016				SEMKO101/ SS443 04-14		UL 1414	EI E101-82	EI E384/14-82	NEMKO NEMXO661/77 NEMXO132/85		DEMKO Section 201		DEMKO Section 21	CSA C22.2 No. 0 No. 1
Part Number	—	X	Y	X	Y	X	Y	X	Y	—	y	X, Y	X	Y	X	Y	X, Y	—
DE7090 B 101K VA1-KC	○	○	○	○	○	—	○	○	○	○	○	○	○	○	○	○	—	○
DE7090 B 151K VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7090 B 221K VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7090 B 331K VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7090 B 471K VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7090 B 102K VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7090 F 152M VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7100 F 222M VA1-KC	○	○	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7120 F 332M VA1-KC	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○
DE7120 F 392M VA1-KC	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○
DE7150 F 472M VA1-KC	○	○	○	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○
DE7100 F 472M VA1-KC	○	○	—	—	—	○	○	○	○	○	○	○	○	○	○	○	○	○
DE7150 F 103M VA1-KC	○	○	—	○	○	—	—	○	—	○	○	—	○	—	○	—	—	○
DE7100 FZ 472P VA1-KC	○	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○	○
DE7150 FZ 103P VA1-KC	○	—	—	—	—	—	—	○	—	○	○	—	○	—	○	—	—	○
AC Rated Voltage	400	250		400		250		400/250		125/250	400	250	250		400		250	125

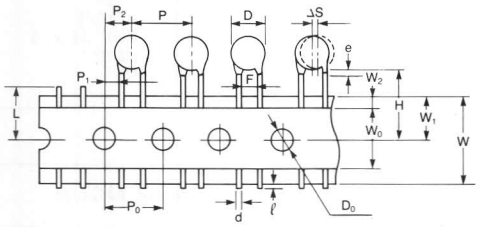
TYPICAL MARKING

1. **Capacitance by three-digit code**
2. **Cap. tolerance by E.I.A. lettercode**
3. **Safety recognition markings**
4. **Type Designation**
5. **Manufacturer's trademark**

All safety recognized capacitors are standard through authorized Murata Electronics Distributors.
★Available as standard through authorized Murata Electronics Distributors.

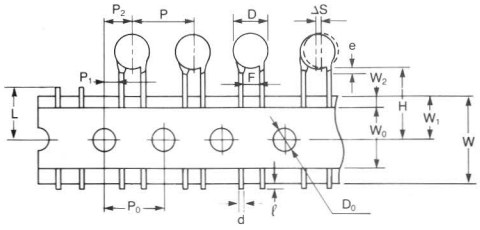
TAPED PACKAGING
MKV & SAFETY CAPACITORS

For MKV up to 2KV DC, ≤ 11 mm Dia.
- 12.7mm pitch/lead spacing 5mm
  (Lead Code: –979)

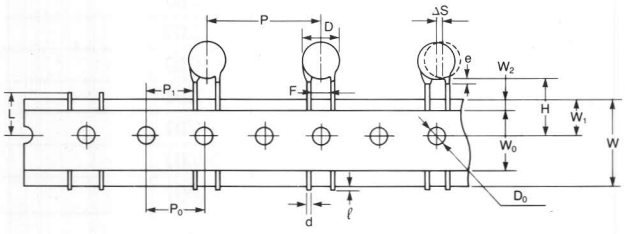


For UP to 13 mm Dia.
- 15mm pitch/lead spacing 7.5mm
  (Lead Code: – 486)

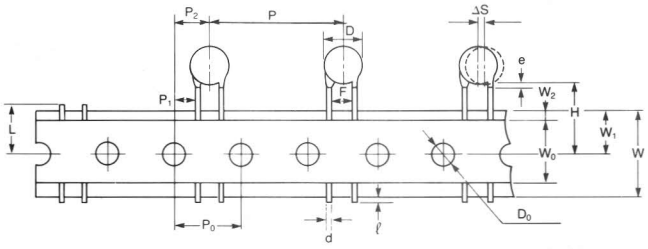
A= Ammo Pack Lead Code



For MKV ≥ 3KV & Safety Caps
- 30mm pitch/lead spacing 7.5mm
  (Lead Code: – 477)



For 10mm Lead Spacing
- 25.4mm pitch/lead spacing 10.0mm
  (Lead Code: – 487)



DIMENSIONS: mm

ITEM	CODE	★-979	★-486	★-487	★-477
Pitch of component	P	12.7	15.0	25.4	30.0
Pitch of sprocket hole	P_0	12.7 ± 0.3	15.0 ± 0.3	12.7 ± 0.3	15.0 ± 0.3
Lead spacing	F	$5.0^{+0.8}_{-0.2}$	7.5 ± 1.0	10.0 ± 1.0	7.5 ± 1.0
Length from hole center to component center	P_2	6.35 ± 1.3	7.5 ± 1.5	—	7.5 ± 1.5
Length from hole center to lead	P_1	3.85 ± 0.7	3.75 ± 1.0	7.7 ± 1.5	3.75 ± 1.0
Body diameter	D	See individual product specifications			
Deviation along tape, left or right	ΔS	0 ± 1.0	0 ± 2.0		
Carrier tape width	W	18.0 ± 0.5			
Position of sprocket hole	W_1	9.0 ± 0.5			
Lead distance between reference and bottom planes	H	$20.0^{+1.5}_{-1.0}$		$18.0^{+2.0}_{-0}$	$20.0^{+1.5}_{-1.0}$
Protusion length	ℓ	+0.5 / –1.0			
Diameter of sprocket hole	D_0	4.0 ± 0.1			
Lead Diameter	d	.6 ± 0.05	.65 ± 0.05		
Total tape thickness	t_1	0.6 ± 0.3			
Total thickness, tape and lead wire	t_2	1.5 max.			
Portion to cut in case of defect	L	$11.0^{+0}_{-1.0}$			
Hold down tape width	W_0	11.5 min.			
Hold down tape position	W_2	1.5 ± 1.5			
Coating extension on lead	e	3.0 max.			

★Available as standard through authorized Murata Electronics Distributors.

HIGH VOLTAGE CERAMIC DISC CAPACITORS E.I.A. CLASS I, CLASS II & CLASS III

PART NUMBERING SYSTEM — E.I.A. CLASS I

DHR19 — **CAPACITOR TYPE AND SIZE**

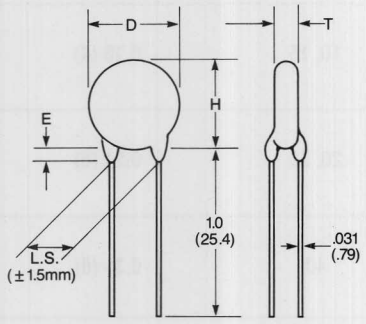
N4700 — **TEMPERATURE CHARACTERISTICS AND T.C. TOLERANCE**
Per standard EIA specifications.

102 — **CAPACITANCE VALUE**
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

M — **CAPACITANCE TOLERANCE**
M = ±20%

10KV — **VOLTAGE**
Identified by a two-digit number.

★10 & 15 KVDC PREFERRED VALUES



PART NUMBER	CAPACITANCE (pF)	WORKING VOLTAGE (KVDC)	DIMENSIONS: in. (mm) D max.	H max.	T max.	L.S.	E max.
DHR12 N4700 221M 10KV	220	10	.472 (12)	.512 (13)	.275 (7)	.375 (9.5)	.197 (5)
DHR15 N4700 331M 10KV	330	10	.590 (15)	630 (16)	.275 (7)	.375 (9.5)	.197 (5)
DHR15 N4700 471M 10KV	470	10	.590 (15)	.630 (16)	.275 (7)	375 (9.5)	.197 (5)
DHR17 N4700 681M 10KV	680	10	.669 (17)	.700 (17.8)	.275 (7)	.375 (9.5)	.197 (5)
DHR19 N4700 102M 10KV	1,000	10	.748 (19)	.791 (20.1)	.275 (7)	.500 (12.7)	.197 (5)
DHR9 N4700 820M 15KV	82	15	.354 (9)	.394 (10)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR9 N4700 101M 15KV	100	15	.354 (9)	.394 (10)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR12 N4700 151M 15KV	150	15	.472 (12)	.512 (13)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR12 N4700 221M 15KV	220	15	.472 (12)	.512 (13)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR15 N4700 331M 15KV	330	15	.590 (15)	.630 (16)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR17 N4700 471M 15KV	470	15	.669 (17)	.697 (17.7)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR19 N4700 681M 15KV	680	15	748 (19)	.787 (20)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR22 N4700 102M 15KV	1,000	15	.866 (22)	.909 (23.1)	.330 (8.4)	.500 (12.7)	.197 (5)

PART NUMBERING SYSTEM — E.I.A. CLASS II & III

DHR17 — **CAPACITOR TYPE AND SIZE**

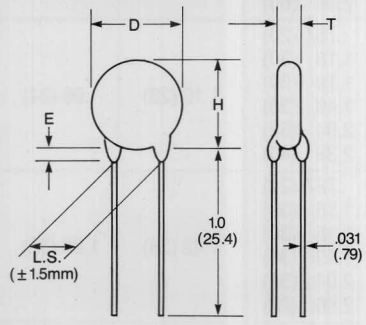
Y5P — **TEMPERATURE CHARACTERISTICS**
Temperature Range
Y5 = -30°C to +85°C; Z5 = +10°C to +85°C
MAX. CAP. CHANGE OVER TEMP. RANGE
P = ±10%; U = +22, -56%

102 — **CAPACITANCE VALUE**
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

M — **CAPACITANCE TOLERANCE**
M = ±20%
Z = +80%, -20%

10KV — **VOLTAGE**
Identified by a two-digit number.

★7.5, 10 & 15 KVDC PREFERRED VALUES



PART NUMBER	CAPACITANCE (pF)	WORKING VOLTAGE (KVDC)	DIMENSIONS: in. (mm) D max.	H max.	T	L.S.	E max.
DHR9 Y5P 101M 7.5KV	100		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.157 (4)
DHR9 Y5P 151M 7.5KV	150		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.157 (4)
DHR9 Y5P 221M 7.5KV	220		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.157 (4)
DHR10 Y5P 331M 7.5KV	330		.394 (10)	.433 (11)	.275 (7)	.375 (9.5)	.157 (4)
DHR12 Y5P 471M 7.5KV	470		.472 (12)	.512 (13)	.275 (7)	.375 (9.5)	.157 (4)
DHR13 Y5P 681M 7.5KV	680	7.5	.512 (13)	.551 (14)	.275 (7)	.375 (9.5)	.157 (4)
DHR15 Y5P 102M 7.5KV	1,000		.590 (15)	.631 (16)	.275 (7)	.375 (9.5)	.157 (4)
DHR9 Z5U 471Z 7.5KV	470		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.157 (4)
DHR10 Z5U 681Z 7.5KV	680		.394 (10)	.433 (11)	.275 (7)	.375 (9.5)	.157 (4)
DHR11 Z5U 102Z 7.5KV	1,000		.433 (11)	.472 (12)	.275 (7)	.375 (9.5)	.157 (4)
DHR13 Z5U 152Z 7.5KV	1,500		.512 (13)	.551 (14)	.275 (7)	.375 (9.5)	.157 (4)
DHR15 Z5U 222Z 7.5KV	2,200		.590 (15)	.631 (16)	.275 (7)	.375 (9.5)	.157 (4)
DHR9 Y5P 151M 10KV	150		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.197 (5)
DHR9 Y5P 221M 10KV	220		.354 (9)	.394 (10)	.275 (7)	.375 (9.5)	.197 (5)
DHR12 Y5P 331M 10KV	330		.472 (12)	.512 (13)	.275 (7)	.375 (9.5)	.197 (5)
DHR15 Y5P 471M 10KV	470	10	.590 (15)	.630 (16)	.275 (7)	.375 (9.5)	.197 (5)
DHR15 Y5P 681M 10KV	680		.590 (15)	.630 (16)	.275 (7)	.375 (9.5)	.197 (5)
DHR17 Y5P 102M 10KV	1,000		.669 (17)	.700 (17.8)	.275 (7)	.500 (12.7)	.197 (5)
DHR24 Y5P 202M 10KV	2,000		.945 (24)	.964 (25)	.275 (7)	.622 (15.8)	.197 (5)
DHR9 Y5P 101M 15KV	100		.354 (9)	.394 (10)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR9 Y5P 151M 15KV	150		.354 (9)	.394 (10)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR12 Y5P 221M 15KV	220		.472 (12)	.512 (13)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR12 Y5P 331M 15KV	330	15	.472 (12)	.512 (13)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR15 Y5P 471M 15KV	470		.590 (15)	.630 (16)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR17 Y5P 681M 15KV	680		.669 (17)	.700 (17.8)	.330 (8.4)	.500 (12.7)	.197 (5)
DHR20 Y5P 102M 15KV	1,000		.787 (20)	.830 (21.1)	.330 (8.4)	.500 (12.7)	.197 (5)

★All preferred values are standard through authorized Murata Electronics Distributors.

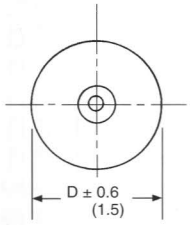
HIGH VOLTAGE CERAMIC CAPACITORS E.I.A. CLASS I

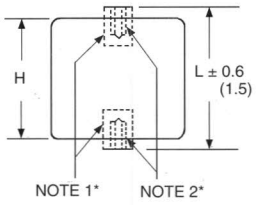
10 to 40KVDC

PART NUMBERING SYSTEM

DHS20	N4700	561	M	10KV
CAPACITOR TYPE AND SIZE	**TEMPERATURE CHARACTERISTICS AND T.C. TOLERANCE** Per standard EIA specifications.	**CAPACITANCE VALUE** Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.	**CAPACITANCE TOLERANCE** M=±20%	**VOLTAGE** Identified by a two-digit number in KVDC.

DIMENSIONS: in.(mm)





NOTE 1: This terminal may extend up to 0.100 (2.5) above insulated surface.

NOTE 2: No. 8-32 NC-28 Tapped holes.

Working Voltage (KVDC)	Depth
10, 15	0.16 (4)
20, 30	0.24 (6)
40	0.31 (8)

★ E.I.A. CLASS I

PART NUMBER	CAPACITANCE (pF)	WORKING VOLTAGE		TEST VOLTAGE (KVDC)	DIMENSIONS: in. (mm)		
		KVDC	KVAC (60Hz)		D	L	H
DHS20 N4700 561M-10KV	560	10	4	15	.787 (20)	.63 (16)	.47 (12)
DHS30 N4700 122M-10KV	1,200				1.18 (30)		
DHS30 N4700 182M-10KV	1,800				1.18 (30)		
DHS38 N4700 282M-10KV	2,800				1.49 (38)		
DHS52 N4700 502M-10KV	5,000				2.04 (52)		
DHS60 N4700 802M-10KV	8,000				2.36 (60)		
DHS20 N4700 371M-15KV	370	15	6	23	.787 (20)	.71 (18)	.55 (14)
DHS30 N4700 801M-15KV	800				1.18 (30)		
DHS30 N4700 112M-15KV	1,100				1.18 (30)		
DHS38 N4700 192M-15KV	1,900				1.49 (38)		
DHS52 N4700 342M-15KV	3,400				2.04 (52)		
DHS60 N4700 532M-15KV	5,300				2.36 (60)		
DHS20 N4700 281M-20KV	280	20	8	30	.787 (20)	.95 (24)	.787 (20)
DHS30 N4700 601M-20KV	600				1.18 (30)		
DHS30 N4700 881M-20KV	880				1.18 (30)		
DHS38 N4700 142M-20KV	1,400				1.49 (38)		
DHS52 N4700 252M-20KV	2,500				2.04 (52)		
DHS60 N4700 402M-20KV	4,000				2.36 (60)		
DHS20 N4700 191M-30KV	190	30	12	45	.787 (20)	1.10 (28)	.95 (24)
DHS30 N4700 401M-30KV	400				1.18 (30)		
DHS30 N4700 591M-30KV	590				1.18 (30)		
DHS38 N4700 941M-30KV	940				1.49 (38)		
DHS52 N4700 172M-30KV	1,700				2.04 (52)		
DHS60 N4700 272M-30KV	2,700				2.36 (60)		
DHS20 N4700 141M-40KV	140	40	16	60	.787 (20)	1.42 (36)	1.26 (32)
DHS30 N4700 301M-40KV	300				1.18 (30)		
DHS30 N4700 441M-40KV	440				1.18 (30)		
DHS38 N4700 701M-40KV	700				1.49 (38)		
DHS52 N4700 132M-40KV	1,300				2.04 (52)		
DHS60 N4700 202M-40KV	2,000				2.36 (60)		

★All high voltage capacitors are standard through authorized Murata Electronics Distributors.

CAUTION FOR USE

Some chemicals may be harmful to the DHS Series when used as an insulating medium. Please consult with Murata Electronics Product Engineering before exposing these capacitors to chemicals such as Freon, oil, etc.

HIGH VOLTAGE CERAMIC CAPACITORS E.I.A. CLASS III

10 to 40KVDC

PART NUMBERING SYSTEM

DHS20 **Z5V** **681** **Z** **10KV**

CAPACITOR TYPE AND SIZE

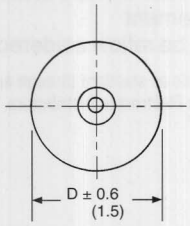
TEMPERATURE CHARACTERISTICS
Temperature Range
Z5=+10°C to +85°C
MAX. CAP. CHANGE OVER TEMP. RANGE
V=+22%, −82%

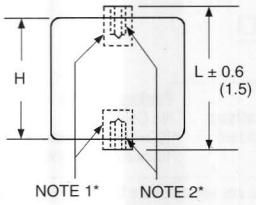
CAPACITANCE VALUE
Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros to follow.

CAPACITANCE TOLERANCE
Z=+80%, −20%

VOLTAGE
Identified by a two-digit number in KVDC.

DIMENSIONS: in.(mm)





NOTE 1: This terminal may extend up to 0.100 (2.5) above insulated surface.

NOTE 2: No. 8-32 NC-28 Tapped holes.

Working Voltage (KVDC)	Depth
10, 15	0.16 (4)
20, 30	0.24 (6)
40	0.31 (8)

E.I.A. CLASS III

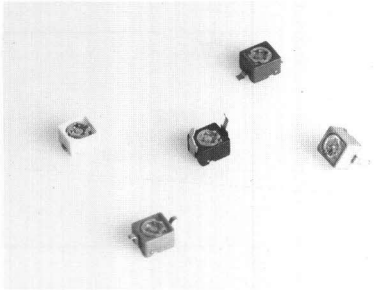
PART NUMBER	CAPACITANCE (pF)	WORKING VOLTAGE (KVDC)	TEST VOLTAGE (KVDC)	DIMENSIONS: in. (mm)		
				D max.	L	H
DHS20 Z5V 681Z-10KV	680			.787 (20)	.75 (19)	.66 (17)
DHS24 Z5V 122Z-10KV	1,200			.94 (24)	.74 (19)	.66 (17)
DHS30 Z5V 202Z-10KV	2,000			1.18 (30)	.75 (19)	.66 (17)
DHS38 Z5V 322Z-10KV	3,200			1.49 (38)	.74 (19)	.66 (17)
DHS43 Z5V 472Z-10KV	4,700	10	15	1.69 (43)	.75 (19)	.66 (17)
DHS52 Z5V 652Z-10KV	6,500			2.04 (52)	.74 (19)	.66 (17)
DHS57 Z5V 832Z-10KV	8,300			2.24 (57)	.75 (19)	.66 (17)
DHS60 Z5V 932Z-10KV	9,300			2.36 (60)	.74 (19)	.66 (17)
DHS20 Z5V 471Z-15KV	470			.787 (20)	.90 (23)	.82 (21)
DHS24 Z5V 801Z-15KV	800			.94 (24)	.90 (23)	.82 (21)
DHS30 Z5V 132Z-15KV	1,300			1.18 (30)	.90 (23)	.82 (21)
DHS38 Z5V 222Z-15KV	2,200	15	23	1.49 (38)	.90 (23)	.82 (21)
DHS43 Z5V 322Z-15KV	3,200			1.69 (43)	.90 (23)	.82 (21)
DHS52 Z5V 462Z-15KV	4,600			2.04 (52)	.90 (23)	.82 (21)
DHS57 Z5V 582Z-15KV	5,800			2.24 (57)	.90 (23)	.82 (21)
DHS60 Z5V 652Z-15KV	6,500			2.36 (60)	.90 (23)	.82 (21)
DHS20 Z5V 351Z-20KV	350			.787 (20)	1.02 (26)	.94 (24)
DHS24 Z5V 601Z-20KV	600			.94 (24)	1.02 (26)	.94 (24)
DHS30 Z5V 102Z-20KV	1,000			1.18 (30)	1.02 (26)	.94 (24)
DHS38 Z5V 162Z-20KV	1,600	20	30	1.49 (38)	1.02 (26)	.94 (24)
DHS43 Z5V 242Z-20KV	2,400			1.69 (43)	1.02 (26)	.94 (24)
DHS52 Z5V 332Z-20KV	3,300			2.04 (52)	1.02 (26)	.94 (24)
DHS57 Z5V 432Z-20KV	4,300			2.24 (57)	1.02 (26)	.94 (24)
DHS60 Z5V 482Z-20KV	4,800			2.36 (60)	1.02 (26)	.94 (24)
DHS20 Z5V 261Z-30KV	260			.787 (20)	1.33 (34)	1.25 (32)
DHS24 Z5V 461Z-30KV	460			.94 (24)	1.33 (34)	1.25 (32)
DHS30 Z5V 781Z-30KV	780			1.18 (30)	1.33 (34)	1.25 (32)
DHS38 Z5V 122Z-30KV	1,200			1.49 (38)	1.33 (34)	1.25 (32)
DHS43 Z5V 182Z-30KV	1,800	30	45	1.69 (43)	1.33 (34)	1.25 (32)
DHS52 Z5V 252Z-30KV	2,500			2.04 (52)	1.33 (34)	1.25 (32)
DHS57 Z5V 332Z-30KV	3,300			2.24 (57)	1.33 (34)	1.25 (32)
DHS60 Z5V 362Z-30KV	3,600			2.36 (60)	1.33 (34)	1.25 (32)
DHS20 Z5V 181Z-40KV	180			.787 (20)	1.61 (41)	1.53 (39)
DHS24 Z5V 341Z-40KV	340			.94 (24)	1.61 (41)	1.53 (39)
DHS30 Z5V 571Z-40KV	570			1.18 (30)	1.61 (41)	1.53 (39)
DHS38 Z5V 921Z-40KV	920			1.49 (38)	1.61 (41)	1.53 (39)
DHS43 Z5V 132Z-40KV	1,300	40	60	1.69 (43)	1.61 (41)	1.53 (39)
DHS52 Z5V 192Z-40KV	1,900			2.04 (52)	1.61 (41)	1.53 (39)
DHS57 Z5V 242Z-40KV	2,400			2.24 (57)	1.61 (41)	1.53 (39)
DHS60 Z5V 272Z-40KV	2,700			2.36 (60)	1.61 (41)	1.53 (39)

★All high voltage capacitors are standard through authorized Murata Electronics Distributors.

CAUTION FOR USE

Some chemicals may be harmful to the DHS Series when used as an insulating medium. Please consult with Murata Electronics Product Engineering before exposing these capacitors to chemicals such as Freon, oil, etc.

CHIP TRIMMING CAPACITORS
TZBX4 Series



This washable chip trimmer capacitor has primarily been developed for consumer products such as small radios, pagers, radio communication equipment and audio equipment. Protected by a thermoset resin case, it provides superior resistance to heat.

FEATURES

- Miniature rectangular configuration with dimensions of just 4.0(W) × 4.5(L) × 3.0(H) (mm)
- Ideal for auto-placement
- Can be immersed in flux and solder bath (260°C, 5 sec.)
- Cleaning is possible with organic solvents
- Models for conventional insertion are available
- Available on tape and reel for auto-placement
- Can be reflow soldered

★Available as standard through authorized Murata Electronics Distributors.

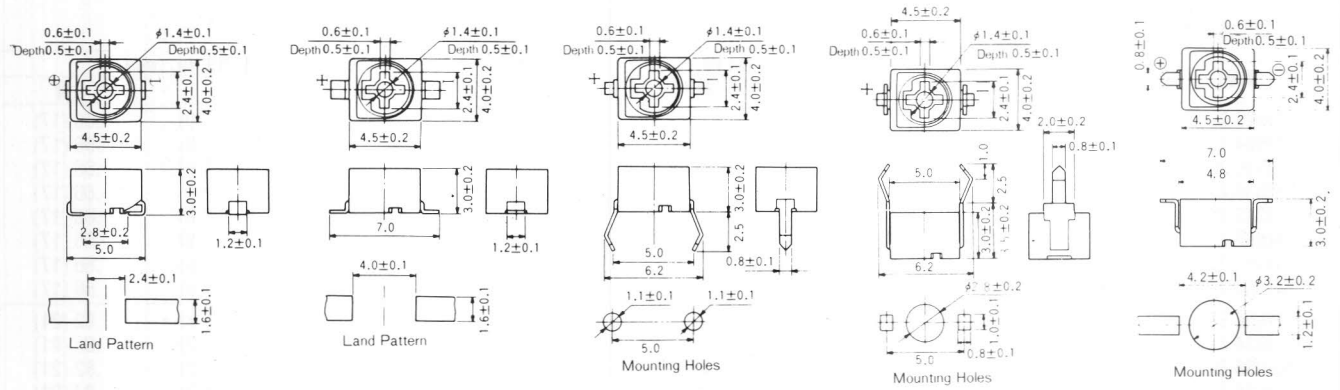
PART NUMBERING SYSTEM

TZBX4 Z 060 B A 110 □□□

- **Type**
- **Temperature Coefficient**
- **Capacitance Value**
- **Cover Film** A=Not Applied, ★B=Applied
- **Terminal Type**
- **Other Specifications** 110: Standard
- **Packaging Unit** No Code=Bulk, ★T00=500 pcs/reel, T02=2500 pcs/reel

DIMENSIONS: mm

CAUTION: These parts are not available for water washing.



Note 1. Terminal type A, B and E type are available for tape packaging.

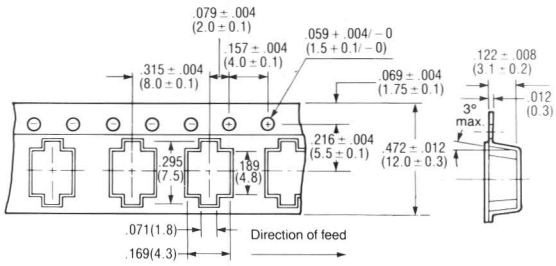
Tolerance: ±0.5

SPECIFICATIONS

Part Number	Capacitance (pF) Min.	Capacitance (pF) Max.	Temperature Coefficient (ppm/°C)	Q (Min.) (1MHz, Cmax)	Temperature (°C)	Case Color
TZBX4Z030□□110	1.4	3.0(+ 50% −0%)	NPO ±200	300	−55 to +85	Brown
TZBX4Z060□□110	2.0	6.0(+ 50% −0%)	NPO ±200	500	−55 to +85	Blue
TZBX4N100□□110	3.0	10.0(+ 50% −0%)	N150 ±300	500	−55 to +85	White
TZBX4R200□□110	4.5	20.0(+ 50% −0%)	N750 ±300	500	−55 to +85	Red
TZBX4P300□□110	6.5	30.0(+ 50% −0%)	N1200±500	300	−55 to +85	Green
TZBX4P400□□110	8.5	40.0(+ 50% −0%)	N1200±500	300	−55 to +85	Yellow
TZBX4Z250□□110	4.0	25.0(+100% −0%)	NPO ±300	300	−55 to +85	Black
TZBX4R500□□110	7.0	50.0(+100% −0%)	N750 ±300	300	−55 to +85	Black

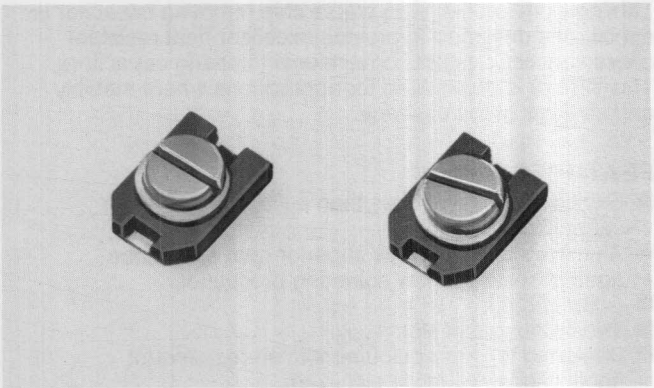
• **Rated Voltage**...100VDC • **Withstanding Voltage**...220VDC • **Insulation Resistance**...10^4MΩ min. • **Torque**...15 to 100g•cm 50VDC for Z250, R500.

PACKAGING



Reel Size: T00: (180mm) Dia.
T02: (330mm) Dia.

CHIP TRIMMER CAPACITORS TZC03 SERIES

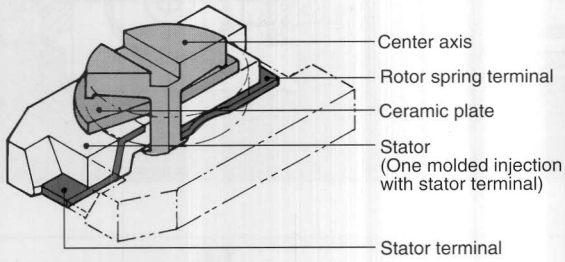


This new low profile chip trimming capacitor is specifically designed to meet the requirements of high density surface mount applications and automated placement equipment.

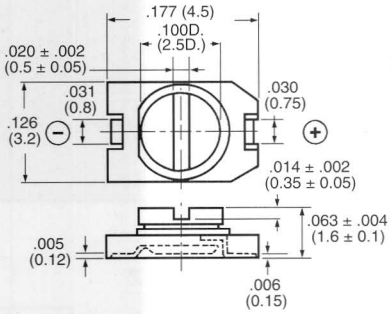
FEATURES

- Extremely small size—just 3.2mm x 4.5mm x 1.6mm
- Designed for auto-placement in surface mount applications
- Color-coded
- Heat-resistant resin withstands reflow soldering temperatures
- Can be adjusted with standard adjustment tools

CONSTRUCTION



DIMENSIONS: in. (mm)



PART NUMBERING SYSTEM

TZC03 Z 060 A 110 T00

- **TZC03** — **CHIP CERAMIC TRIMMER CAPACITOR**
- **Z** — **TEMPERATURE CHARACTERISTIC**
- **060** — **CAPACITANCE**
- **A** — **TERMINAL TYPE**
- **110** — **OTHER SPECIFICATIONS**
  110: Standard
- **T00** — **PACKAGING UNIT**
  ★T00: 180D.mm Taping (1000 pcs/reel)
  T01: 330D.mm Taping (4000 pcs/reel)
  No code: Bulk (500 pcs/bulk)

CAUTION: These units are unsealed, therefore avoid washing.

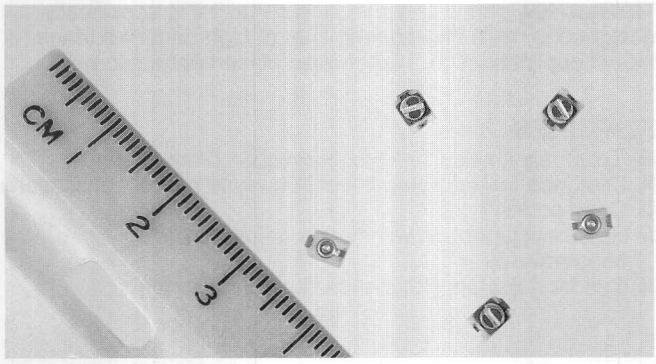
SPECIFICATIONS

Part Number	Capacitance		Temperature Coefficient (ppm/°C)	Q (1MHz, Cmax.)	Working Temperature Range (°C)	Stator Color
	Min. (max.)	Max. (+50%,–0%)				
★TZC03Z030A110	1.4	3.0	NP0 ± 300	300 min.	–25 to +85	White
★TZC03Z060A110	2.0	6.0	NP0 ± 300	500 min.	–25 to +85	Blue
★TZC03R100A110	3.0	10.0	N750 ± 300	500 min.	–25 to +85	White
★TZC03P200A110	5.0	20.0	N1200 ± 500	300 min.	–25 to +85	Red
★TZC03P300A110	6.5	30.0	N1200 ± 500	300 min.	–25 to +85	Green

• **Rated Voltage**...100VDC • **Withstanding Voltage**...220VDC • **Insulation Resistance**...10^4 MΩmin. • **Torque**...15 to 100g•gm

★Available as standard through authorized Murata Electronics Distributors.

CHIP TRIMMER CAPACITORS TZCX3 SERIES

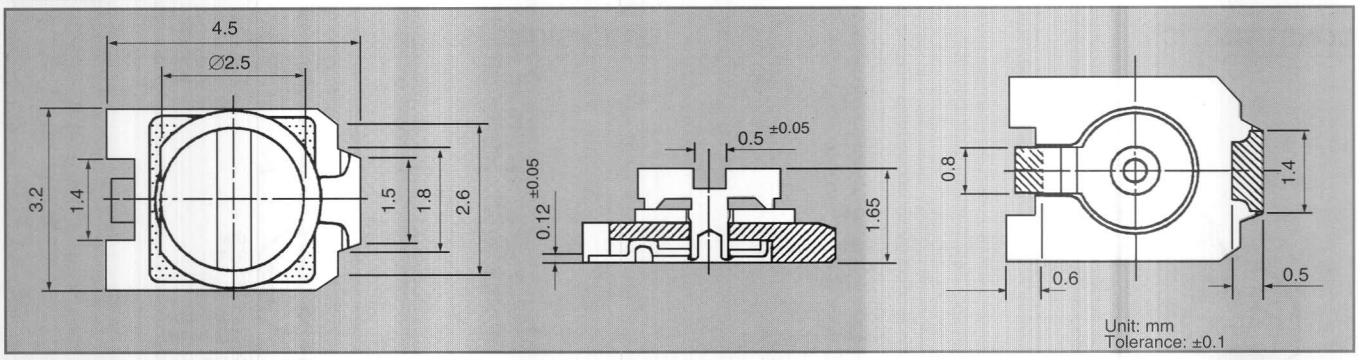


This new low profile, ultra stable chip trimming capacitor is specifically designed to provide excellent heat resistant characteristics against conventional trimming capacitors. The TZCX3 is best suited for applications where stability and size are of the essence.

FEATURES

- Excellent stability – less than ±1% setting drift for capacitance value.
- Alumina stator provides superior heat resistance against severe reflow soldering processes.
- Color coded.
- Wide adjustment slot.
- Designed for Auto-placement in surface mount applications.

DIMENSIONS



PART NUMBERING SYSTEM

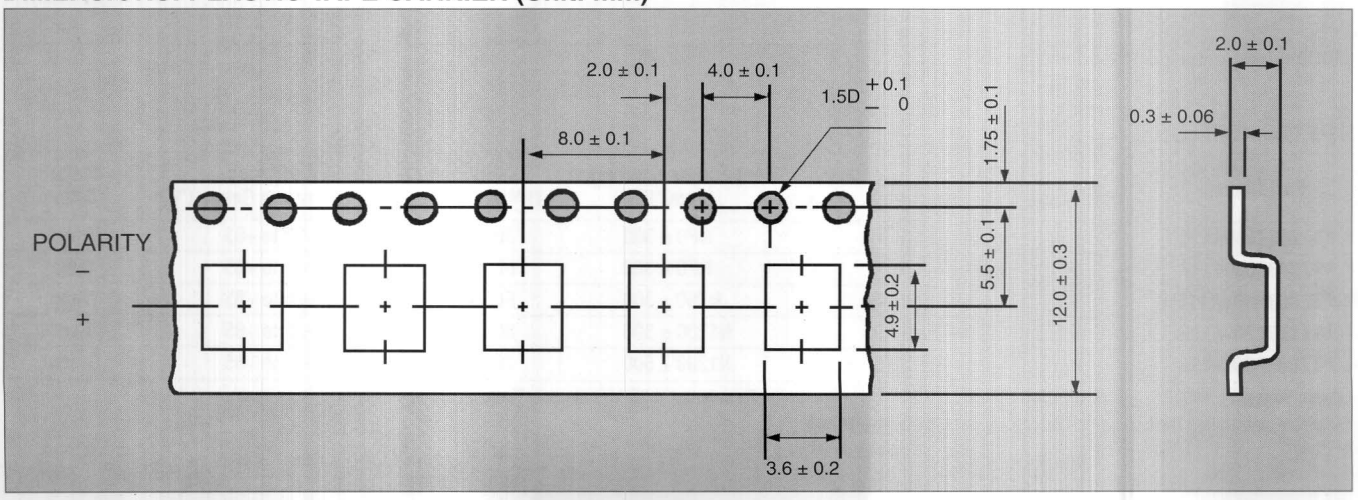
TZCX3	Z	060	A	110	T00
Chip Trimmer Capacitor	**Temperature Characteristic**	**Capacitance**	**Terminal Type**	**Other Specifications** 110: Standard	**Packaging Unit** T00: 180D.mm Taping (1000 pcs/reel) T01: 330D.mm Taping (4000 pcs/reel) No code: Bulk (500 pcs/bag)

SPECIFICATIONS

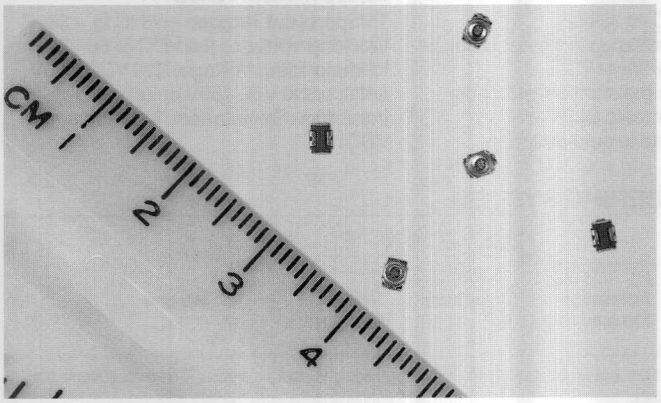
Part Number	Capacitance (pF)		Temperature Coefficient (ppm/°C)	Q (1MHz, C max.)	Stator Color
	Min.(max.)	Max.(+70%,–0%)			
TZCX3Z030A110	1.5	3.0	NP0 ± 200	500 min.	Brown
TZCX3Z060A110	2.5	6.0	NP0 ± 300	500 min.	Blue
TZCX3R100A110	3.5	10.0	N750 ± 300	500 min.	——
TZCX3P200A110	5.5	20.0	N1200 ± 500	300 min.	Red

• **Rated Voltage**...50VDC • **Withstanding Voltage**...110VDC • **Insulation Resistance**...10^4 MΩmin. • **Torque**...15~100g•cm • **Operating Temperature**...–25~+85°C

DIMENSIONS: PLASTIC TAPE CARRIER (Unit: mm)



CHIP TRIMMER CAPACITORS TZV02 SERIES

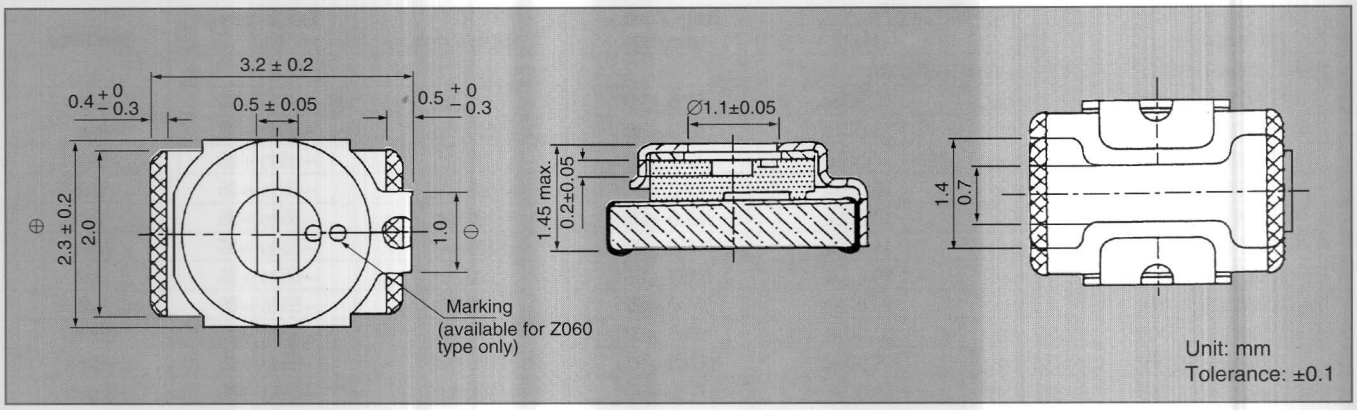


The latest generation of chip trimming capacitors uses Murata's technology advancements in monolithic construction to obtain an ultra stable, ultra small package with a maximum height of only 1.45mm. The TZV02 is best suited for applications where package size and high reliability are the foremost concerns.

FEATURES

- Smallest size available – just 2.3mm x 3.2mm x 1.45mm.
- Designed for auto-placement in surface mount applications.
- Superior heat resistant characteristics against reflow soldering temperatures.
- Rugged construction provides minimized capacitance drift after adjusting.

DIMENSIONS



PART NUMBERING SYSTEM

TZV02	Z	060	A	110	T00
Chip Trimmer Capacitor	Temperature Characteristic	Capacitance	Terminal Type	Other Specifications 110: Standard	Packaging Unit T00: 180D.mm Taping (2000 pcs/reel) T01: 330D.mm Taping (8000 pcs/reel) No code: Bulk (500 pcs/plastic bag)

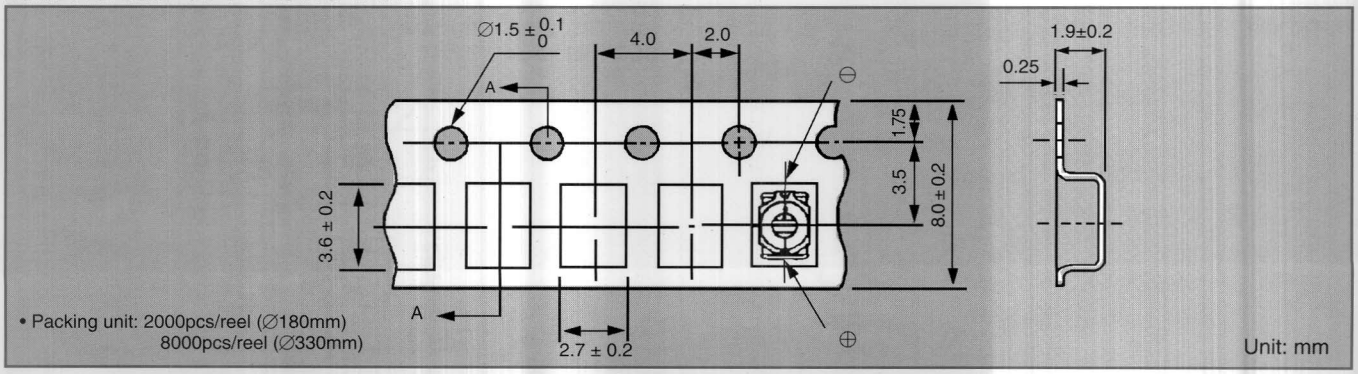
CAUTION: Do not wash.

SPECIFICATIONS

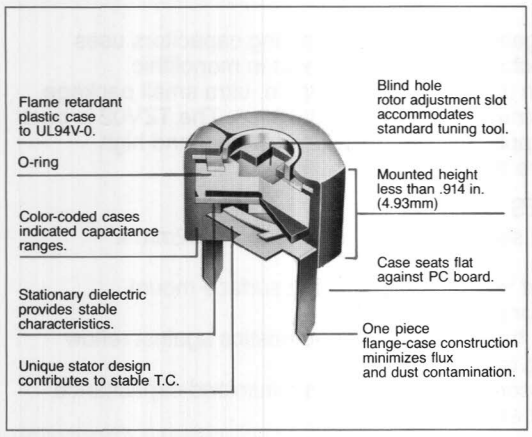
Part Number	Capacitance (pF)		Temperature Coefficient (ppm/°C)	Q (1MHz, C max)	Stator Color
	Min. (+0%)	Max. ($^{+100}_{-0}$%)			
TZV02Z030A110	1.4	3.0	NP0 ± 500	300 min.	White
TZV02Z060A110	2.5	6.0	NP0 ± 500	500 min.	Light Green
TZV02Z100A110	3.0	10.0	NP0 ± 500	500 min.	Light Green
TZV02R200A110	4.5	20.0	N750 ± 500	500 min.	Brown

- **Rated Voltage**...25VDC
- **Withstanding Voltage**...55VDC
- **Insulation Resistance**...10^4MΩmin.
- **Driving Torque**...15~100g•cm
- **Operating Temperature Range**...–25~+85°C

DIMENSIONS OF PLASTIC TAPE



CERAMIC TRIMMING CAPACITORS
TZ03 SERIES



FEATURES

- QPL to MIL-C-81 (CV42)
- Excellent shock and vibration resistance
- Exceptionally linear TC
- Dust and flux resistant construction
- Plastic case meets UL94V-0
- Very adaptable to auto-insertion

SPECIFICATIONS

Temperature Range: −55°C to +85°C
Working Voltage: 100 VDC or 50 VDC
Withstanding Voltage: 220 VDC (100V units) or 110 VDC (50V units)
Insulation Resistance: 10^4MΩ min. (50 VDC)

PART NUMBERING SYSTEM

TZ03 Z 070 ER 169

- **TZ03** — Type
- **Z** — Temperature Characteristic
- **070** — Capacitance (pF)
- **ER** — Terminal Configuration
- **169** — 169: Standard

Note: ER Terminal Style is available as tape and ammo packaging for radial insertion. Please consult with the factory for more details.

Caution: Not available for use in water wash processes.

SPECIFICATIONS

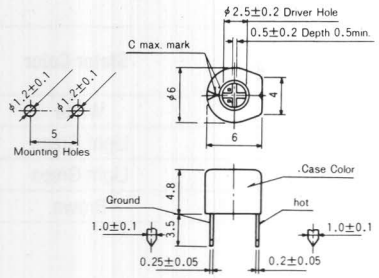
Part Number	Capacitance (pF) Min.	Capacitance (pF) Max.	Temp. Coeff. (ppm/°C)	Q 1MHz, C max.)	Temperature (°C)	Case Color
SINGLE CERAMIC PLATE TYPE, 100V SERIES						
★TZ03Z2R3□□169	1.25 max.	$2.3^{-0}_{+50\%}$	NPO ±200	300 min.	−55 to +85	Black
★TZ03Z050□□169	1.8 max.	$5.0^{-0}_{+50\%}$	NPO ±200	300 min.	−55 to +85	Blue
① ★TZ03Z070□□169	2.0 max.	$7.0^{-0}_{+50\%}$	NPO ±200	300 min.	−55 to +85	Blue
★TZ03Z100□□169	2.7 max.	$10.0^{-0}_{+50\%}$	NPO ±200	500 min.	−55 to +85	Blue
★TZ03N100□□169	2.1 max.	$10.0^{-0}_{+50\%}$	N200 ±200	500 min.	−55 to +85	White
① ★TZ03T110□□169	3.0 max.	$11.0^{-0}_{+50\%}$	N450 ±300	500 min.	−55 to +85	White
① ★TZ03T200□□169	4.2 max.	$20.0^{-0}_{+50\%}$	N450 ±300	500 min.	−55 to +85	Pink
① ★TZ03R200□□169	4.2 max.	$20.0^{-0}_{+50\%}$	N750 ±300	500 min.	−55 to +85	Red
① ★TZ03R300□□169	5.2 max.	$30.0^{-0}_{+50\%}$	N750 ±300	500 min.	−55 to +85	Green
★TZ03P450□□169	6.8 max.	$45.0^{-0}_{+50\%}$	N1200 ±500	300 min.	−55 to +85	Yellow
★TZ03P600□□169	9.8 max.	$60.0^{-0}_{+50\%}$	N1200 ±500	300 min.	−55 to +85	Brown
★TZ03P700□□169	12.0 max.	$70.0^{-0}_{+50\%}$	N1200 ±500	300 min.	−55 to +85	Brown
MONOLITHIC CERAMIC PLATE TYPE, 50V SERIES						
★TZ03Z500□□169	6 max.	$50^{-0}_{+100\%}$	NPO ±300	300 min.	−55 to +85	Orange
★TZ03R900□□169	9 max.	$90^{-0}_{+100\%}$	N750 ±300	300 min.	−55 to +85	Black
★TZ03R121□□169	10 max.	$120^{-0}_{+100\%}$	N750 ±300	300 min.	−55 to +85	Black

□□: Terminal Shape

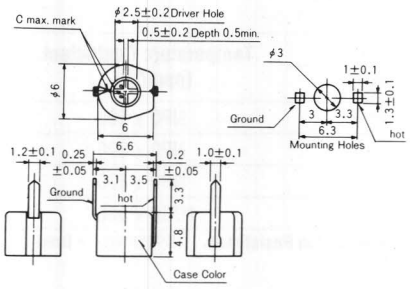
Stray capacitance for side adjustment (YR type) adaptor is .2pF.

DIMENSIONS: mm

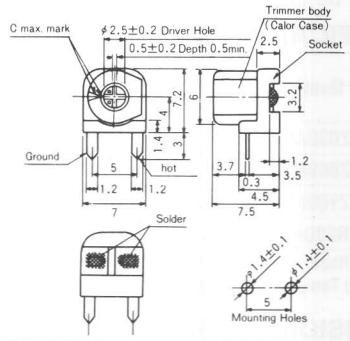
★ER TYPE, TOP ADJUSTMENT



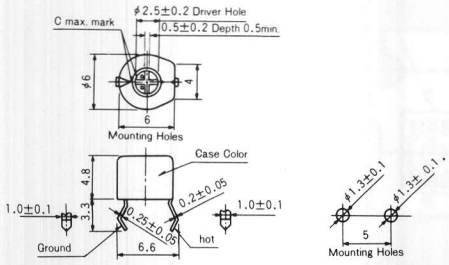
BR TYPE, BOTTOM ADJUSTMENT



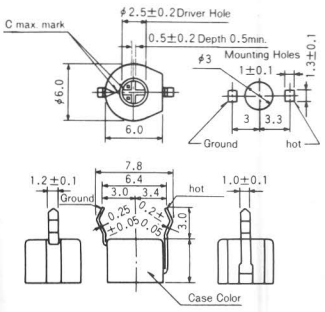
YR TYPE, SIDE ADJUSTMENT



★FR TYPE, SELF-STANDING

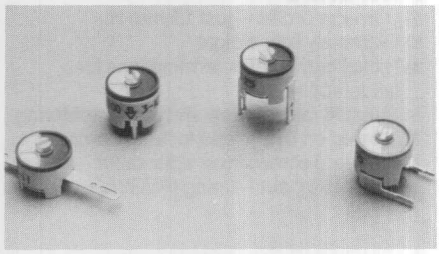


NR TYPE, SELF-STANDING, BOTTOM ADJUSTMENT



★Available as standard through authorized Murata Electronics Distributors.

CERAMIC TRIMMING CAPACITORS
DV11 SERIES



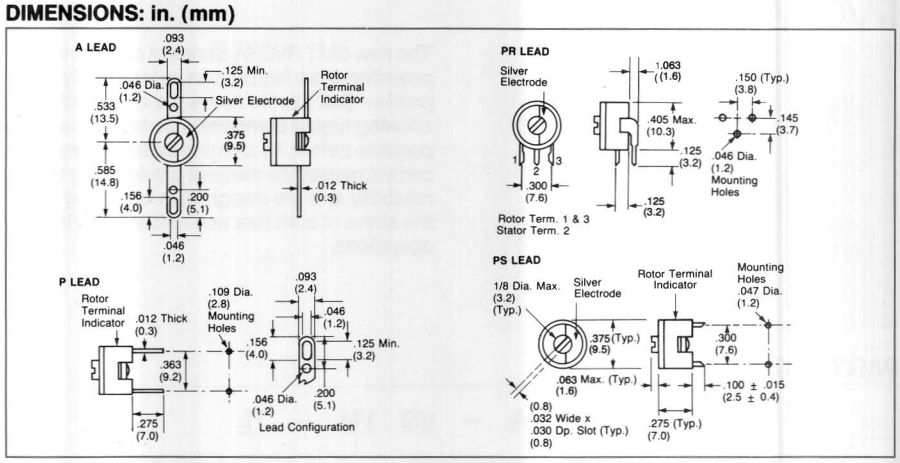
SPECIFICATIONS

Operating Temp. Range:	-55 to +125°C
Working Voltages:	350 VDC for -55 to +85°C 200 VDC for +85 to 125°C Except N650 and N1500 units; 200 VDC for -55 to +85°C 100 VDC for +85 to +125°C
Test Voltage:	500 VDC
"Q" Factor:	500 min. @ 1MHz
Insulation Resistance:	10^4 megohms min.
Tuning Torque:	1 to 16 in.-oz.

PART NUMBERING SYSTEM

DV11	PS	18	A
SERIES	MOUNTING STYLE	MAX. CAP.	TC CODE

DIMENSIONS: in. (mm)



PREFERRED VALUES

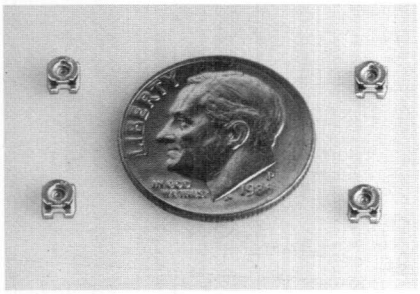
DV11 Part Number	Cap. Range Min.	Cap. Range Max.	Nominal TC in ppm/°C
★DV11A8A	2.0	8.0	NPO
DV11A11B	2.5	11.0	N300
DV11A15D	3.0	15.0	N650
★DV11A18A	5.5	18.0	NPO
★DV11A25B	7.0	25.0	N300
★DV11A35D	9.0	35.0	N650
★DV11A60Q	15.0	60.0	N1500
★DV11P8A	2.0	8.0	NPO
★DV11P11B	2.5	11.0	N300
★DV11P15D	3.0	15.0	N650
★DV11P18A	5.5	18.0	NPO
★DV11P25B	7.0	25.0	N300
★DV11P35D	9.0	35.0	N650
★DV11P60Q	15.0	60.0	N1500

PREFERRED VALUES

DV11 Part Number	Cap. Range Min.	Cap. Range Max.	Nominal TC in ppm/°C
★DV11PR8A	2.0	8.0	NPO
★DV11PR11B	2.5	11.0	N300
★DV11PR15D	3.0	15.0	N650
★DV11PR18A	5.5	18.0	NPO
★DV11PR25B	7.0	25.0	N300
★DV11PR35D	9.0	35.0	N650
★DV11PR60Q	15.0	60.0	N1500
★DV11PS8A	2.0	8.0	NPO
★DV11PS11B	2.5	11.0	N300
★DV11PS15D	3.0	15.0	N650
★DV11PS18A	5.5	18.0	NPO
★DV11PS25B	7.0	25.0	N300
★DV11PS35D	9.0	35.0	N650
★DV11PS60Q	15.0	60.0	N1500

★ Available as standard through authorized Murata Electronics Distributors.

CHIP, CERMET LOW PROFILE RVG3A



The new SMT RVG3A Series of chip trimming potentiometers features an exceptionally low profile—just 1.5 mm above the PC board—allowing higher component densities than possible before. Its alumina substrate and cermet resistance element provide long term reliability and are designed to withstand the stress of both flow and reflow soldering operations.

FEATURES

- Ultra-low profile—just 1.5 mm H.
- Extremely light weight
- Nickel barrier layer terminations for solderability
- Suitable for both flow and reflow soldering
- Offered on 8 mm tape for auto-placement
- Standard screw driver adjustable
- Suitable for auto-tuning (RVG3A08)

PART NUMBERING SYSTEM

RVG3 A 01A – 103 VM – TL

TYPE

ADJUSTMENT

SERIAL NO.
01=Standard
08=Phillips Head

RESISTANCE
ex.: (103=10KΩ)

TOLERANCE
VM=±25%

PACKAGING

RVG3A01A
Blank=Bulk
TL =Tape 180 mm D. reel (2500 pcs/reel)
TM=Tape 330 mm D. reel (8000 pcs/reel)

RVG3A08A
Blank=Bulk
TP =Tape 180 mm D. reel (2000 pcs/reel)
TR =Tape 330 mm D. reel (8000 pcs/reel)

STANDARD RESISTANCES

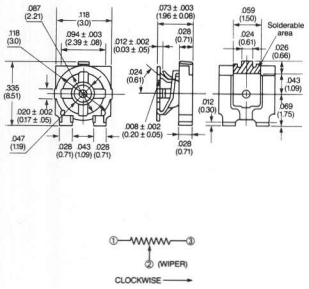
RES. (ohms)	CODE	RES. (ohms)	CODE
200	201	50K	503
500	501	100K	104
1K	102	200K	204
2K	202	500K	504
5K	502	1M	105
10K	103	2M	205
20K	203		

ENVIRONMENTAL CHARACTERISTICS

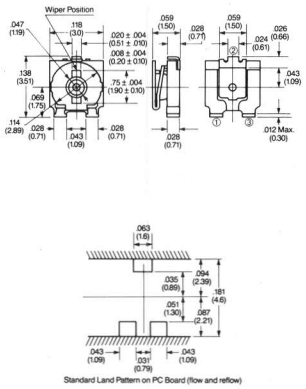
Humidity Load Life	Res. Change : +3%
Load Life	Res. Change : ±3%
Temperature Cycle	Res. Change : ±3%
Temperature Coefficient of Resistance	±250 ppm/°C
Rotational Life (20 Cycle)	Res. Change : ±10%

DIMENSIONS: in. (mm)

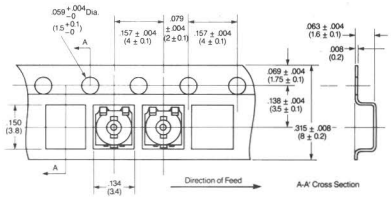
RVG3A01A



RVG3A08A (Phillips Head)



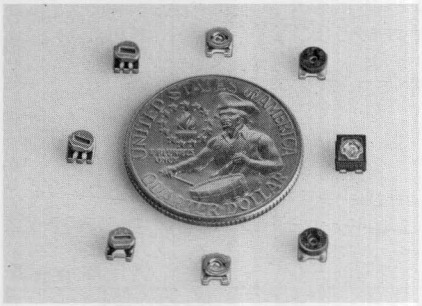
TAPE & REEL



SPECIFICATIONS

Resistance Range	200Ω to 2MΩ
Resistance Tolerance	±25%
Taper	Linear
Power Rating	1/10W at 70°C
Maximum Working Voltage	50V DC
Operating Temperature Range	–55°C to +125°C
Rotational Torque	2.0 to 24.5 mNm
Effective Rotational Angle	270°, ±10°

CHIP TRIMMING POTENTIOMETERS CERMET
RVG4J, RVG4H, RVG4M



The RVG4 series has presoldered electrodes to facilitate surface mounted auto-placement and reflow soldering. The wide 200° rotational angle improves performance and resistance range.

APPLICATIONS

The RVG4 series are widely applicable for fine circuit adjustments in consumer electronic equipment such as small VTR cameras, TV tuners, portable TV and stereo sets, as well as transceiver communication circuits and industrial motor controllers, photoelectric switches and medical electronic equipment.

FEATURES

- Miniature size—3.8×4.5 ×2.25(mm) for close component spacing
- Easily adjusts with regular screwdriver
- Large, solid axle not affected by vacuum chuck during auto-placement
- Nickel barrier layer terminals eliminate solder leaching in reflow soldering operation (H type)
- Available on 12mm Tape and Reel for auto-placement

PART NUMBERING SYSTEM

RVG4 J 03A – 103 VM –TC

Type	Terminal	Serial No.	Resistance Code (103=10KΩ)	Resistance Tolerance VM=±25%	Package TA=Tape and Reel (500 pcs/1 Reel) (M Type) TC=Tape and Reel (1000 pcs/1 Reel) (H, J Type)

STANDARD RESISTANCES

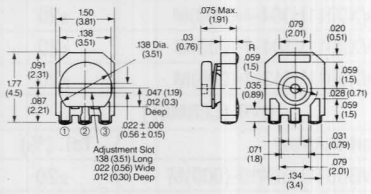
RES. (ohms)	CODE	RES. (ohms)	CODE
100	101	20K	203
200	201	30K	303
300	301	50K	503
500	501	100K	104
1K	102	200K	204
2K	202	300K	304
3K	302	500K	504
5K	502	1M	105
10K	103	2M	205

SPECIFICATIONS

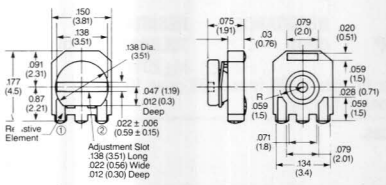
Item	RVG4M	RVG4H	RVG4F
Resistance Range	100Ω to 2MΩ		
Tolerance	±25%		
Taper	B (Linear)		
Power Rating	0.1W at 70°C		
Max. Working Voltage	50V DC		
Torque	2.0 to 24.5mNm		
Electrical Rotation	200°±10°		

DIMENSIONS: in. (mm)

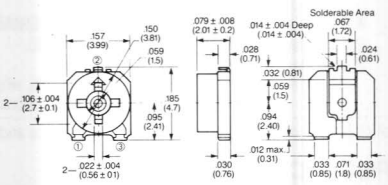
★RVG4J03A



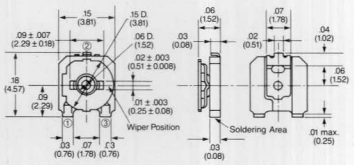
★RVG4J04A



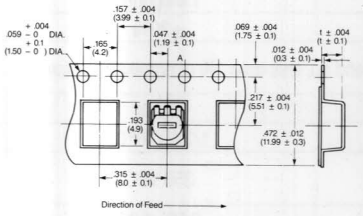
★RVG4M08A (SEALED)



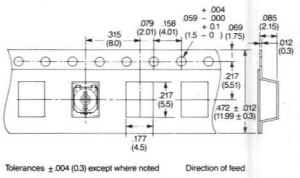
★RVG4H01A



PLASTIC TAPE



TAPE



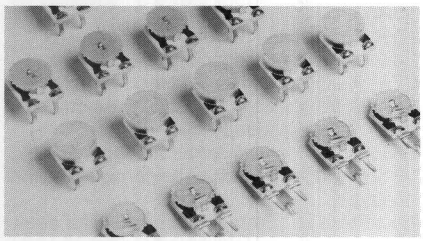
ENVIRONMENTAL SPECIFICATIONS

	Resistance Change	Condition					
Humidity	±3%	500 hrs. at 40°C, 90-95% RH without loading, and 5 hrs. at room temperature.					
Temperature Exposure	±3%	500 hrs., at 70°C without loading, and 1.5 hrs. at room temperature.					
Humidity Load Life	±3%	At 40°C, 90-95% RH rated voltage 1.5 hrs. ON, and 0.5 hrs. OFF for 1000±12 hrs. and 5 hrs. at room temperature.					
Temperature Load Life	±3%	At 70°C, rated voltage 1.5 hrs. ON and 0.5 hrs. OFF for 1000±12 hrs. and 5 hrs. at room temperature.					
Temperature Cycling	±3%	5 cycles	Sequence	1	2	3	4
			Temp. (°C)	–55	+25	+125	+25
			Time (min.)	30	10	30	10
Temperature Coefficient of Resistance	±250ppm/°C		Sequence	1	2	3	4
			Temp. (°C)	+25	–55	+25	+125
			Time (min.)	30 to 45 each			
Rotational Life	±10%	Continuous 10 cycles without loading					

All values are standard through authorized Murata Electronics Distributors.

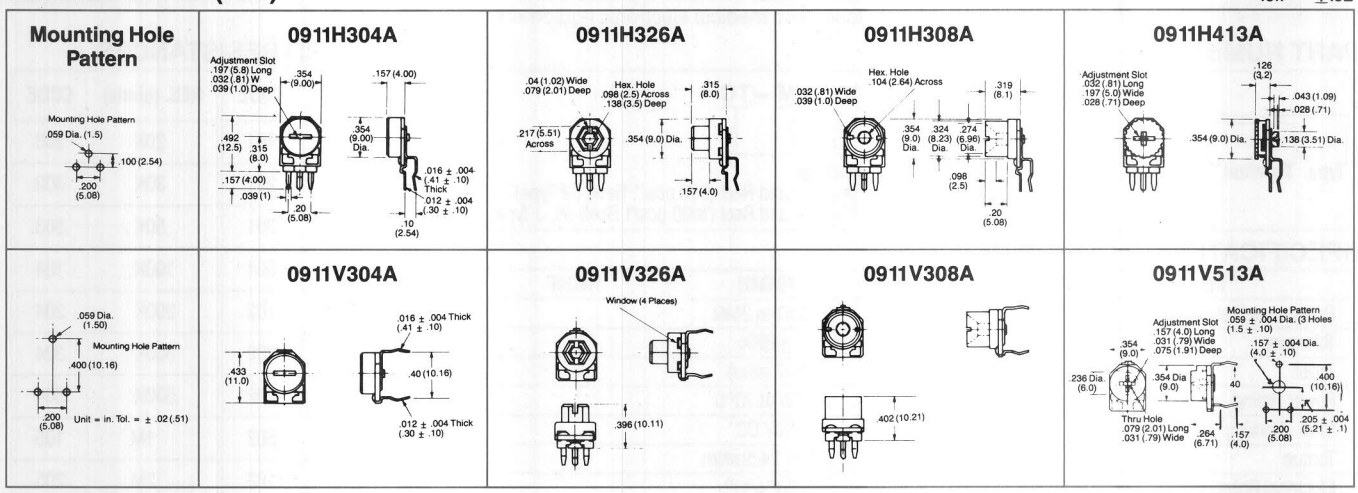
SUBMINIATURE TRIMMING POTENTIOMETERS
1/5 Watt Carbon, 1/2 Watt Cermet

RVX, RVG



DIMENSIONS in. (mm)

Tol. = ±.02



PART NUMBERING SYSTEM

RVX 0911 H 304A 04 — 103 M

MODEL	ADJUSTMENT	SERIAL NO.	KNOB COLOR*	RESISTANCE CODE	RESISTANCE TOLERANCE CODE
RVG = Cermet RVX = Carbon	V=Vert., H=Hor.				M±20%

*01, red; 02, green; 03, blue; 04, yellow; 05, white; 06, orange; 07, natural; 08, brown; 09, gray; 10, black
For other knob configurations, contact factory.

MARKING: Marked with Standard EIA date, resistance and tolerance codes.

RVX (CARBON)	
Part Number	**Tol. (%)**
★RVX0911H304-4-(000)M	±20
★RVX0911V304-4-(000)M	±20
★RVX0911V513-4-(000)M	±20
RVG (CERMET)	
Part Number	**Tol. (%)**
★RVG0911H30410-(000)M	±20
★RVG0911V30410-(000)M	±20
★RVG0911H41310-(000)M	±20
★RVG0911V51310-(000)M	±20

SPECIFICATIONS

Characteristic		RVX (Carbon)	RVG (Cermet)
Resistance Range		0911 100— 2 Megohms	0911 200— 1 Megohm
Tolerance		±20%	±20%
Residual Resistance		Less than 500Ω, 5Ω max. 500Ω and up, less than 1% of nominal resistance	
Taper		Linear	Linear
Power Rating**		1/5W (70°C)	1/2W (70°C)
Max. Working Voltage		250 VDC	350 VDC
Torque		0.56 - 4.86 in. oz.	0.56 - 4.86 in. oz.
Terminal Strength		35.27 oz.	35.27 oz.
Effective Rotation	Elec.	240°	240°
	Mech.	260°±10°	260°±10°
Stop Strength		13.9 in. oz.	

*Derated to 0 watts at 100°C (for Carbon, at 125°C (for Cermet)

★STANDARD RESISTANCES

RVX 0911 CARBON					
RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
100	101	3K	302	100K	104
200	201	5K	502	200K	204
300	301	10K	103	300K	304
500	501	20K	203	500K	504
1K	102	30K	303	1M	105
2K	202	50K	503	2M	205

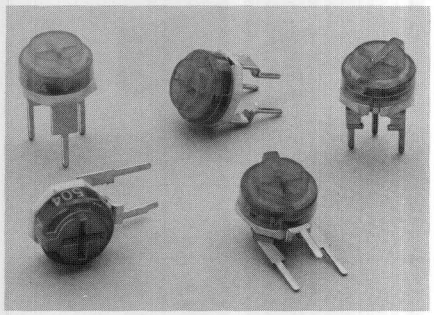
RVG 0911 CERMET					
RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
200	201	5K	502	100K	104
300	301	10K	103	200K	204
500	501	20K	203	300K	304
1K	102	30K	303	500K	504
2K	202	50K	503	1M	105
3K	302				

★All preferred values are available as standard through authorized Murata Electronics Distributors.

MICROMINIATURE TRIMMING POTENTIOMETERS
1/3 Watt Cermet

muRata

RVG



FEATURES

- Excellent humidity characteristics
- Dust-resistant construction
- Non-combustible design
- 1/3 watt power rating
- Economical
- Miniature size
- Wide resistance range

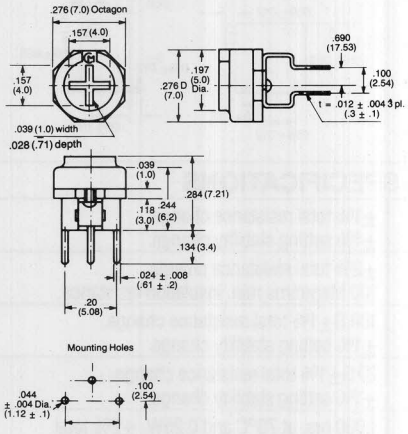
APPLICATIONS

The Murata Electronics Model RVS, RVG 0707 is widely applicable for data processing equipment, for circuit adjustment in portable transceivers, electronic musical instruments, household appliances, (television receivers, radio receivers, tape-recorders), and in many other types of electronic equipment.

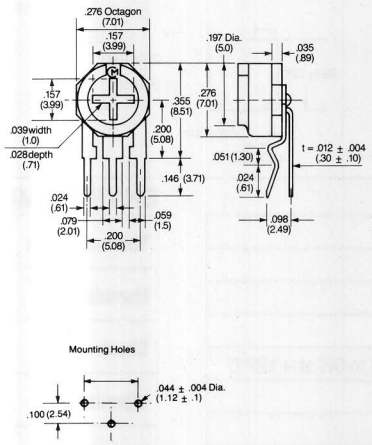
DIMENSIONS: in. (mm)

Tol. = ± .02 (.51)

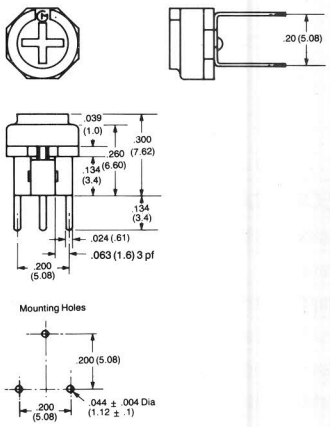
★0707V100A



★0707H100A



0707V101A



PART NUMBERING SYSTEM

RVG 0707H 100A 10 – 103 M

MODEL	SERIAL NO.	KNOB COLOR*	RESISTANCE CODE	RESISTANCE TOLERANCE
RVS=Special Cermet RVG=Cermet		03: Blue for RVS 10: Black for RVG		M=±20%

★STANDARD RESISTANCES

RES. (ohms)	CODE
100	101
200	201
300	301
500	501
1K	102
2K	202
3K	302
5K	502
10K	103
20K	203
30K	303
50K	503
100K	104
200K	204
300K	304
500K	504
1M	105

SPECIFICATIONS

Resistance Range	100 ohms to 1 Megohm (RVS), 200 ohms to 1 Megohm (RVG)
Tolerance	±20%
Temperature Coefficient	±100ppm/°C (RVS), ±250ppm/°C (RVG)
Residual Resistance	Less than 500Ω, 5Ω max. 500Ω and up, less than 1% of nominal resistance.
Taper	Linear
Power Rating	1/3W (at 70°C) Derated to 0 watts at 125°C
Max. Working Voltage	100 VDC
Torque	.27 to 2.8 in. oz
Terminal Strength	12.35 oz. when the force is applied in the direction of the axes of the terminal.
Effective Rotation	Elect. 180° Mech. 200°±10°

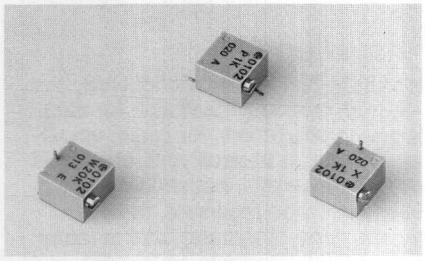
Available as standard through authorized Murata Electronics Distributors.

PREFERRED TYPES

RVG (CERMET)	
PART NUMBER	**TOL. (%)**
★RVG0707H100-10-(000)M	±20
★RVG0707V100-10-(000)M	±20
RVS (SPECIAL CERMET)	
★RVS0707H100-3-(000)M	±20
★RVS0707V100-3-(000)M	±20

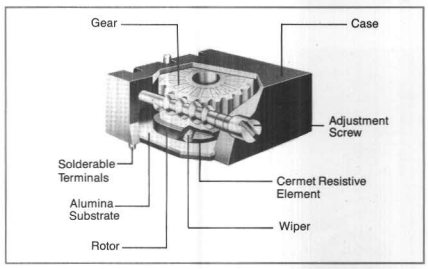
MINIATURE
12 TURNED, SEALED, SURFACE MOUNT
1/4" SQUARE

POT0102

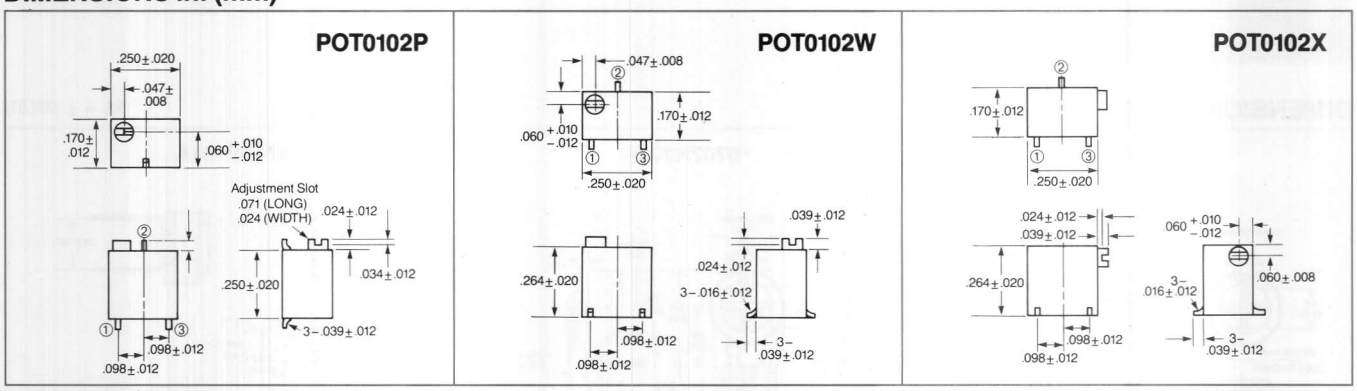


FEATURES:

- Miniature size—.250" × .250" × .169"
- 12-turn
- Will withstand industrial cleaning processes
- Cermet resistance element
- For surface mount applications
- Reflow solderable



DIMENSIONS in. (mm)



SPECIFICATIONS

Resistance Range	10 ohms to 1 Megohm
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max.
Power Rating	0.25W at 85°C. Derated to 0W at +125°C
Working Voltage	200 VDC max.
Operating Temp. Range	−55°C to +125°C
Contact Resistance Variation	3% or 3 ohms max., whichever is greater
Dielectric Strength	600 VAC
Insulation Resistance	1,000 Megohms min. at 500 VDC
Torque	3.0 in.-oz. max.
Effective Electrical Adjust.	12 turns, ±2 turns

ENVIRONMENTAL SPECIFICATIONS

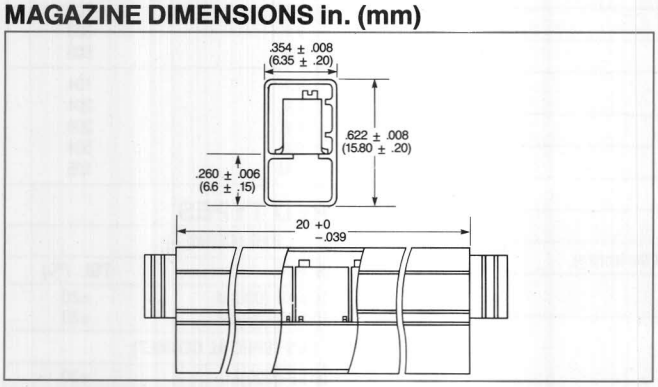
Thermal Shock	±1% total resistance change. ±1% setting stability change.
Humidity	±2% total resistance change. 100 Megohms min. insulation resistance.
Shock	100 G±1% total resistance change. ±1% setting stability change.
Vibration	20 G±1% total resistance change. ±1% setting stability change.
Load Life	1,000 hrs. at 70°C and 0.25W. ±2% total resistance change. ±2% setting stability change.
Low Temperature Operation	24 hrs. at −55°C. ±1% total resistance change. ±1% setting stability change.
High Temperature Exposure	24 hrs. at +125°C. ±2% total resistance change. ±1% setting stability change.
Rotational Life	200 cycles without discontinuity.

PART NUMBERING SYSTEM

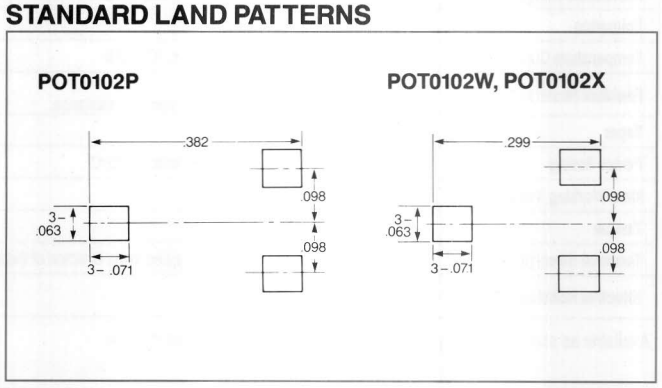
POT0102 P – 1 – 100 K – M2

- MODEL
- ADJ. POSITION: P=Side W=Top X=Side
- VARIATION: STD=1
- RESISTANCE CODE
- RESISTANCE TOLERANCE: K=±10% (STD)
- PACKAGING: M2=Magazine (STD)

MAGAZINE DIMENSIONS in. (mm)



STANDARD LAND PATTERNS



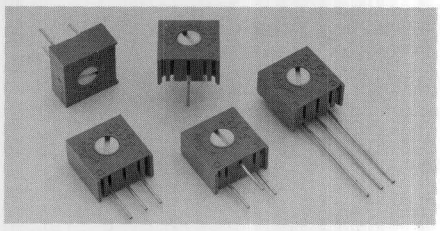
STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	100	101	1K	102	10K	103	50K	503	250K	254
20	200	200	201	2K	202	20K	203	100K	104	500K	504
50	500	500	501	5K	502	25K	253	200K	204	1M	105

MICROMINIATURE TRIMMING POTENTIOMETERS
1/3 Watt Cermet

muRata

POT3104



FEATURES

- Very low-cost
- Standard 3/8″ square configuration
- Low temperature coefficient — ±100 ppm/°C from –55°C to +125°C
- Sealed construction. Will withstand industrial cleaning processes.
- Cermet resistance element

DIMENSIONS: in. (mm)

Tol. = ± .02 (.51)

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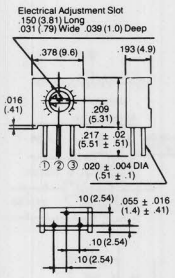
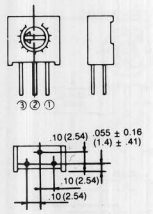
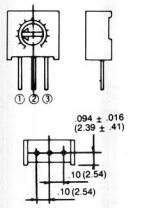
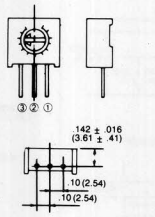
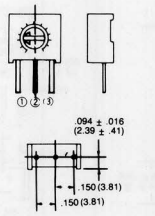
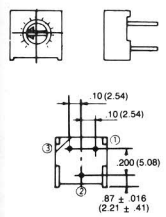
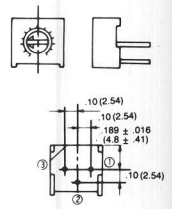
						

PART NUMBERING SYSTEM

POT3104	H	–	1	–	100	K
MODEL	CONFIGURATION		VARIATION STD=-1		RESISTANCE CODE	RESISTANCE TOLERANCE K=±10% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	10K	103
20	200	20K	203
50	500	25K	253
100	101	50K	503
200	201	100K	104
500	501	200K	204
1K	102	250K	254
2K	202	500K	504
5K	502	1M	105
		2M	205

SPECIFICATIONS

Resistance Range	10 ohms to 2 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max.
Power Rating	0.5W at 70°C. Derated to 0W at +125°C
Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +125°C
Contact Resistance Variation	1% or 1 ohms max. whichever is greater
Dielectric Strength	900 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC
Torque	5 in.-oz. max.
Effective Electrical Rotation	280° nominal

PREFERRED TYPES

PART NO.	TOL. (%)	CONFIG.
★POT3104H-1-(000)K	±10	H
★POT3104X-1-(000)K	±10	X
★POT3104W-1-(000)K	±10	W
★POT3104C-1-(000)K	±10	C
★POT3104S-1-(000)K	±10	S

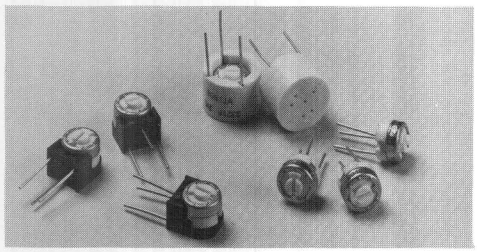
NOTE: ALL OHMIC VALUES STANDARD DISTRIBUTOR ITEMS. REPLACE (000) WITH 3 DIGIT OHMIC CODE. EX. 103 = 10K OHMS.

★Available as standard through authorized Murata Electronics Distributors.

MINIATURE SINGLE-TURN SEALED TRIMMING POTENTIOMETERS

1/4″ Diameter

POT3321

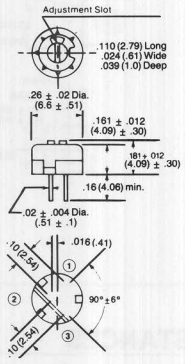
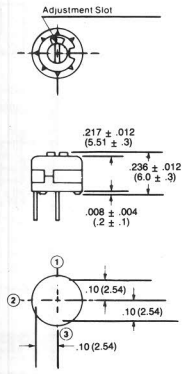
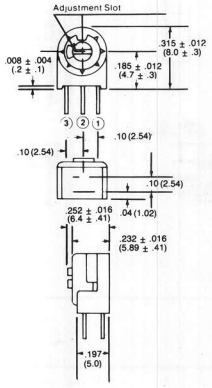
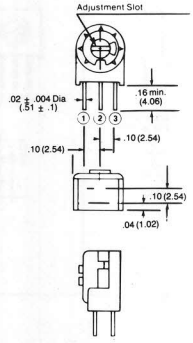
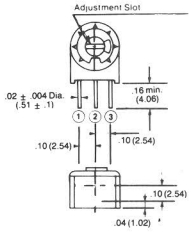
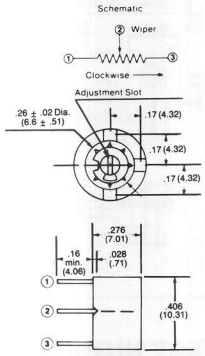


FEATURES

- **Flame retardant rotor meets UL94V-0 requirements**
- **Extremely small size—.260″ D. x .181″**
- **Wide variety of terminal configurations**
- **Cermet element**
- **Sealed to withstand wave soldering and immersion cleaning processes.**

DIMENSIONS: in. (mm)

Tolerance: ±.01 (0.25) except where noted

★POT3321H	★POT3321P	★POT3321N	★POT3321T	★POT3321S	★POT3321F
					

PART NUMBERING SYSTEM

POT3321 H — 1 — 100 M

- **MODEL**
- **ADJ. POSITION**
  H=Top, P=Top, N=Side, A=Side, S=Side, T=Side, F=Bottom
- **VARIATION**
  1 = Standard
  2 = For 10% Tolerance
- **RESISTANCE CODE**
- **RESISTANCE TOLERANCE**
  M = ±20%
  (K = ±10% also available)

STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	500	501	10K	103	200K	204
20	200	1K	102	20K	203	500K	504
50	500	2K	202	50K	503	1M	105
100	101	5K	502	100K	104	2M	205
200	201					5M	505

SPECIFICATIONS

Resistance Range	10 ohms to 5 Megohms
Tolerance	± 20% (± 10% available)
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max.
Power Rating	0.5W at 70°C. Derated to 0W at +150°C
Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +150°C
Contact Resistance Variation	3% or 3 ohms max. whichever is greater
Dielectric Strength	600 VAC, room conditions
Insulation Resistance	1000 Megohms min. at 500 VDC
Torque	2.8 in.-oz. max.
Effective Electrical Rotation	230° nominal

★Available as standard through authorized Murata Electronics Distributors.

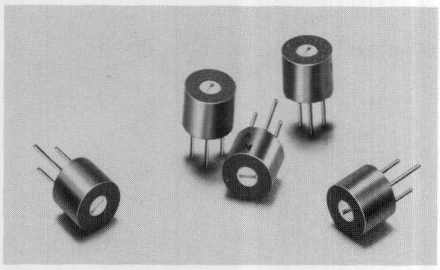
PREFERRED VALUES

PART NO.	TOL. (%)	CONFIG.
★POT3321H-1-(000)M	±20	H
★POT3321P-1-(000)M	±20	P
★POT3321N-1-(000)M	±20	N
★POT3321T-1-(000)M	±20	T
★POT3321S-1-(000)M	±20	S

MINIATURE 4-TURN, SEALED TRIMMING POTENTIOMETERS
5/16" Diameter

muRata

POT1102

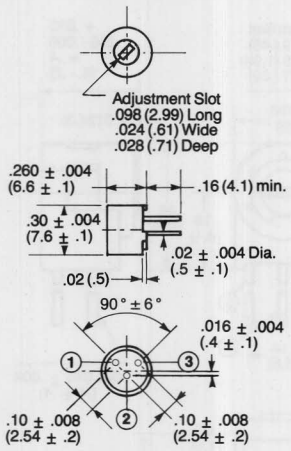
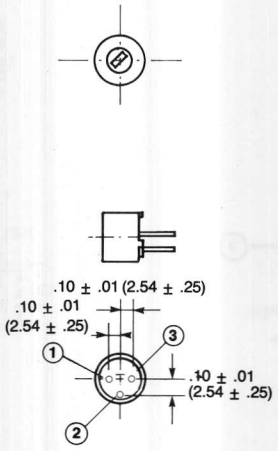
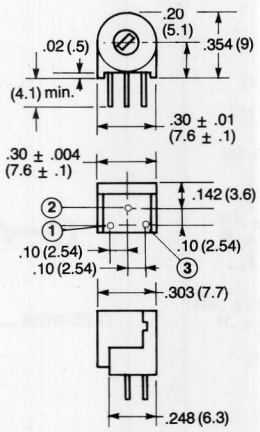
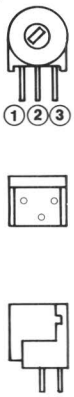


FEATURES

- **Unique planetary drive produces the precise setting capability of a multi-turn unit in a small single-turn package.**
- **Just .300D x .260**
- **Sealed to withstand wave soldering and immersion cleaning process.**

DIMENSIONS: in. (mm)

Tolerance: ± .012 (.3) except where indicated

★POT1102H	★POT1102P	★POT1102T	★POT1102S
			

PART NUMBERING SYSTEM

POT1102 H — 1 — 100 K

- **MODEL**
- **ADJ. POSITION**: H=Top, P=Top, T=Side, S=Side
- **VARIATION**: 1 = STD
- **RESISTANCE CODE**
- **RESISTANCE TOLERANCE**: K=±10% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	500	501	10K	103	200K	204
20	200	1K	102	20K	203	500K	504
50	500	2K	202	50K	503	1M	105
100	101	5K	502	100K	104	2M	205
200	201						

SPECIFICATIONS

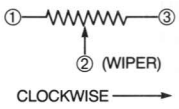
Resistance Range	10 ohms to 2 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	1% or 2 ohms max. whichever is greater
Power Rating	0.5W at 70°C. Derated to 0W at +125°C
Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +125°C
Contact Resistance Variation	3% or 3 ohms max. whichever is greater
Dielectric Strength	600 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC.
Torque	2.08 in.-oz. max.
Effective Electrical Adjust.	4 turns nominal

★Available as standard through authorized Murata Electronics Distributors.

PREFERRED TYPES

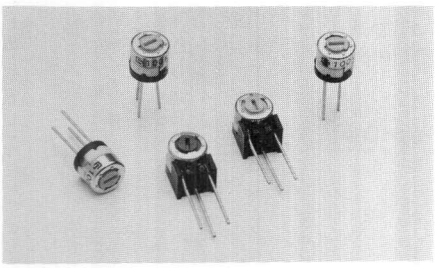
PART NO.	TOL. (%)	CONFIG.
★POT1102H-1-(000)K	±10	H
★POT1102P-1-(000)K	±10	P
★POT1102S-1-(000)K	±10	S
★POT1102T-1-(000)K	±10	T

SCHEMATIC



MINIATURE, SINGLE-TURN TRIMMING POTENTIOMETERS
3/16″ Diameter, 1/4 Watt Cermet

POT1103



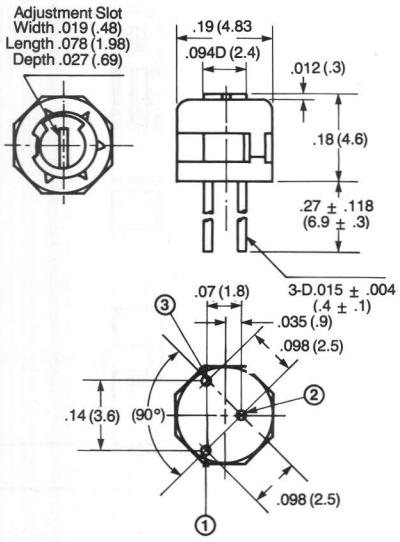
FEATURES

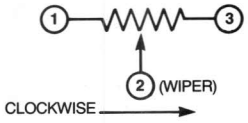
- **Extremely small size — .189″ Dia. x .181″**
- **Flame retardant rotor meets UL94V-O requirements.**
- **Sealed to withstand wave soldering and immersion cleaning processes.**

DIMENSIONS: in. (mm)

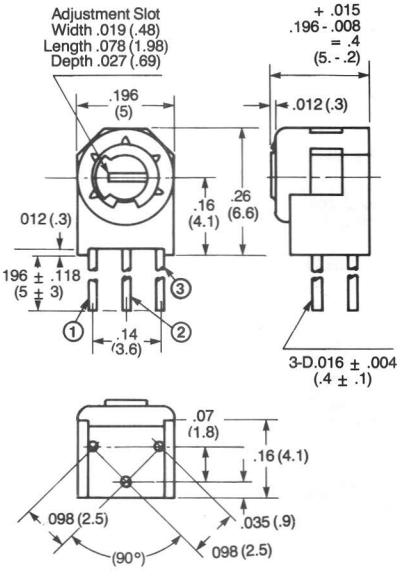
Tolerance: ± .012 (.3) except where indicated

POT 1103H





POT 1103B



PART NUMBERING SYSTEM

POT1103 — H — 1 — 100 — M

- **MODEL**
- **ADJ. POSITION** H=Top, B=Side
- **VARIATION** 1 = STD
- **RESISTANCE CODE**
- **RESISTANCE TOLERANCE** M=±20% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE
10	100
20	200
50	500
100	101
200	201
500	501
1K	102
2K	202
5K	502
10K	103
20K	203
50K	503
100K	104
200K	204
500K	504
1M	105
2M	205

SPECIFICATIONS

Resistance Range	10Ω to 2MΩ
Tolerance	±20%
Temperature Coefficient	± 100ppm/°C (R>50ℓ)
Residual Resistance	1% or 2Ω max., whichever is greater
Power Rating	0.25W at 70°. 0W at +125°C
Working Voltage	200 VDC max.
Operating Temp. Range	-55°C to +125°C
Contact Resistance Variation	3% or 3Ω
Dielectric Strength	500 VAC
Insulation Resistance	1,000MΩ min. at 500 VDC.
Torque	1.39 oz. in. max.

All values are standard through authorized Murata Electronics Distributors.

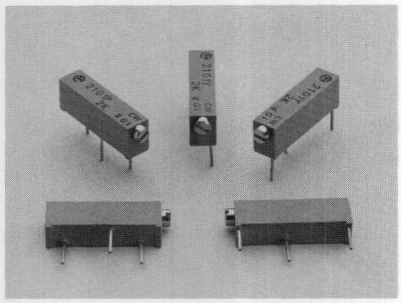
PREFERRED TYPES

PART NO.	TOL. (%)	CONFIG.
POT1103H-1-(000)M	±20	H
POT1103B-1-(000)M	±20	B

15-TURN, SEALED TRIMMING POTENTIOMETERS
3/4" Rectangular

muRata

POT2103

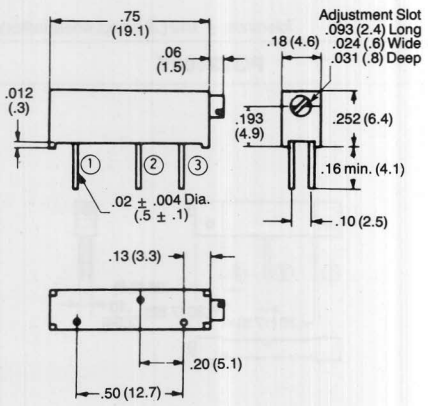
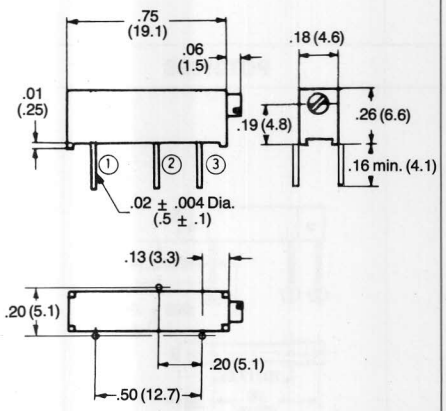
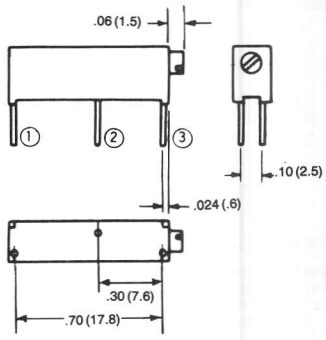


FEATURES

- **Small size — .181" x .252" x .752"**
- **15-Turn**
- **Sealed to MIL-R-22097 standards. Will withstand industrial cleaning processes.**
- **Cermet resistance element**

DIMENSIONS: in. (mm)

Tolerance: ± .012 (.3) except where indicated

★POT2103P	★POT2103W	★POT2103Y
		

PART NUMBERING SYSTEM

POT2103 Y — 1 — 100 K

- **MODEL**
- **PIN CONFIGURATION**: P=Printed Circuit Pins; Y=Printed Circuit Pins; W=Printed Circuit Pins
- **VARIATION**: 1 = STD
- **RESISTANCE CODE**
- **RESISTANCE TOLERANCE**: K=±10% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE
10	100
20	200
50	500
100	101
200	201
500	501
1K	102
2K	202
5K	502
10K	103
20K	203
50K	503
100K	104
200K	204
500K	504
1M	105
2M	205

SPECIFICATIONS

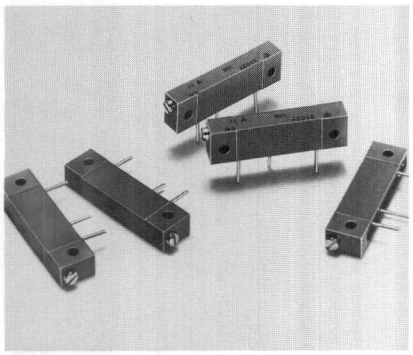
Resistance Range	10 ohms to 2 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max.
Power Rating	0.75W at 70°C. Derated to 0W at +125°C
Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +125°C
Contact Resistance Variation	3% or 3 ohms max. whichever is greater
Dielectric Strength	1,000 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC.
Torque	2.8 in.-oz. max.
Effective Electrical Adjust.	15 turns nominal

PREFERRED VALUES

PART NO.	TOL. (%)	CONFIG.
POT2103P-1-(000)K	±10	P
POT2103W-1-(000)K	±10	W
POT2103Y-1-(000)K	±10	Y

22-TURN, SEALED TRIMMING POTENTIOMETERS
1 1/4" Rectangular

POT2102



FEATURES

- **22-turn mechanism provides extremely fine adjustment capability**
- **High power dissipation: 1.0W at 70°C**
- **Sealed to withstand wave soldering and immersion cleaning**

PART NUMBERING SYSTEM

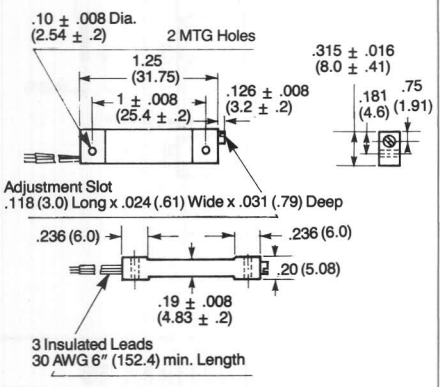
POT2102 L — 1 — 100 K

- **Model**
- **Pin Configuration**
  L=Standard Insulated Lead Wire
  S=Printed Circuit Pins
  Y=Printed Circuit Pins
- **Variation**
  1 = STD
- **Resistance Code**
- **Resistance Tolerance**
  K=±10% (STD)

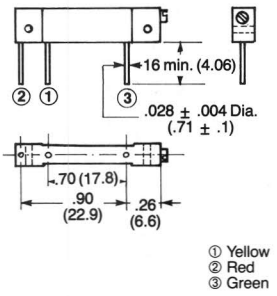
DIMENSIONS: in. (mm)

Tolerance: ± .012 (.3) except where indicated

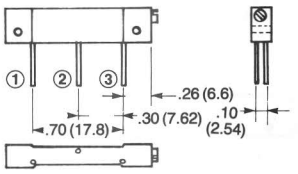
POT2102L



POT2102S



POT2102Y



STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	500	501	10K	103	500K	504
20	200	1K	102	20K	203	750K	754
50	500	2K	202	50K	503	1M	105
100	101	5K	502	100K	104	2M	205
200	201			200K	204		

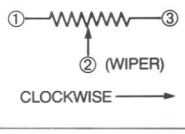
SPECIFICATIONS

Resistance Range	10 ohms to 2 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max.
Power Rating	1W at 70°C. Derated to 0W at +150°C
Max. Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +150°C
Contact Resistance Variation	3% or 3 ohms max. whichever is greater
Dielectric Strength	1,000 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC
Torque	2.8 in.-oz. max
Effective Electrical Adjust.	22 turns nominal

PREFERRED VALUES

PART NO.	TOL. (%)	CONFIG.
POT2102L-1-(000)K	±10	L
POT2102S-1-(000)K	±10	S
POT2102Y-1-(000)K	±10	Y

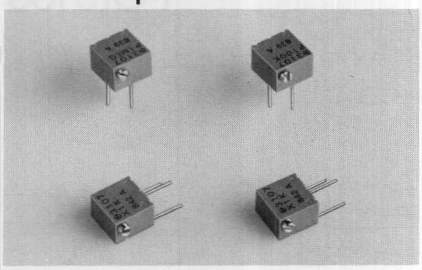
SCHEMATIC



MINIATURE 12-TURN, SEALED TRIMMING POTENTIOMETERS
1/4" Square

muRata

POT3107

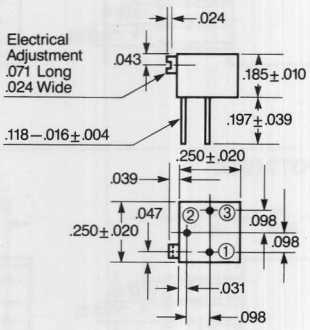


FEATURES
- Miniature size—.250" × .250" × .169"
- 12-Turn
- Sealed to MIL-R-22097 Standards. Will withstand industrial cleaning processes.
- Cermet Resistance Element

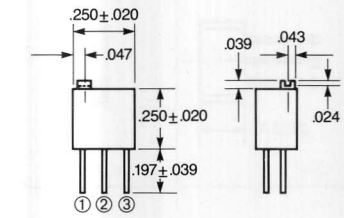
DIMENSIONS: in.

Tolerance: ±.012 except where noted

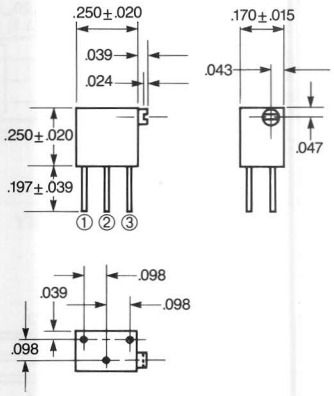
POT3107P



POT3107W



POT3107X



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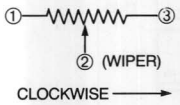


PART NUMBERING SYSTEM

POT3107 P – 1 – 100 K

MODEL	ADJ. POSITION	VARIATION	RESISTANCE CODE	RESISTANCE TOLERANCE
	P=Side W=Top X=Side	STD=1		K=±10% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	20K	203
20	200	50K	503
50	500	100K	104
100	101	200K	204
200	201		
500	501	500K	504
1K	102	1M	105
2K	202		
5K	502		
10K	103		

SPECIFICATIONS

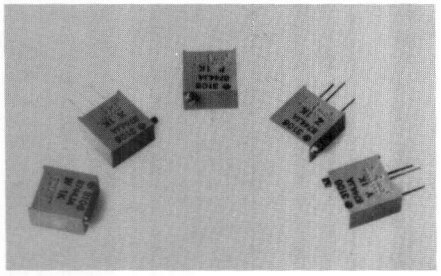
Resistance Range	10 ohms to 1 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	1% or 2 ohms max. whichever is greater
Power Rating	.25W at 70°C. Derated to 0W at +125°C
Working Voltage	200 VDC max.
Operating Temp. Range	–55°C to +125°C
Contact Resistance Variation	3% or 3 ohms max. whichever is greater
Dielectric Strength	600 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC
Torque	3.0 in. oz max.
Effective Electrical Adjust.	12 turns nominal

PREFERRED TYPES

PART NO.	TOL. (%)	CONFIG.
POT3107P-1-(000)K	±10	P
POT3107X-1-(000)K	±10	X
POT3107W-1-(000)K	±10	Y

MINIATURE 25-TURN, SEALED TRIMMING POTENTIOMETERS
3/8″ Square

POT3106

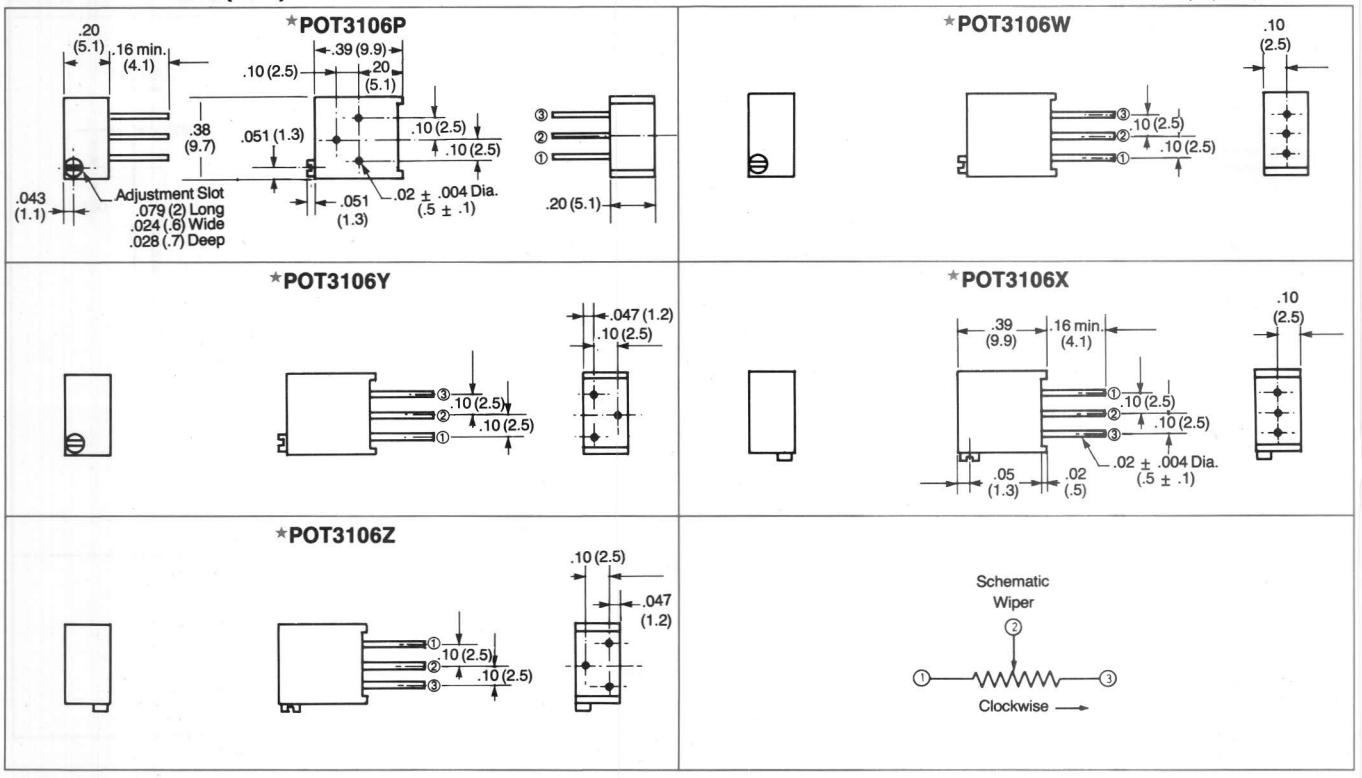


FEATURES

- **Low profile–.374″ x .394″ x .200″**
- **25-turn**
- **Sealed to MIL-R-22097 Standards. Will withstand industrial cleaning processes.**
- **Cermet resistance element**

DIMENSIONS: in. (mm)

Tolerance: ± .012 (0.3) except where noted



PART NUMBERING SYSTEM

POT3106 — P — 1 — 100 — K

MODEL	ADJ. POSITION	VARIATION	RESISTANCE CODE	RESISTANCE TOLERANCE
	P=Side X=Side W=Top Z=Side Y=Top	1 = STD		K=±10% (STD)

STANDARD RESISTANCES

RES. (ohms)	CODE	RES. (ohms)	CODE
10	100	20K	203
20	200	25K	253
50	500	50K	503
100	101	100K	104
200	201	200K	204
500	501	250K	254
1K	102	500K	504
2K	202	1M	105
5K	502	2M	205
10K	103		

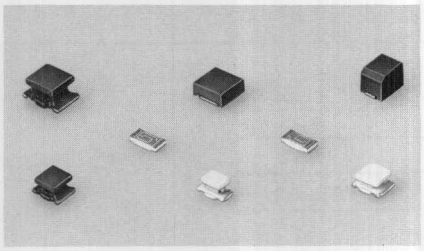
SPECIFICATIONS

Resistance Range	10 ohms to 2 Megohms
Tolerance	±10%
Temperature Coefficient	±100ppm/°C
Residual Resistance	2 ohms max
Power Rating	0.5W at 70°C. Derated to 0W at +125°C
Working Voltage	300 VDC max.
Operating Temp. Range	-55°C to +125°C
Contact Resistance Variation	3% or 3 ohms max., whichever is greater
Dielectric Strength	1,000 VAC, room conditions
Insulation Resistance	1,000 Megohms min. at 500 VDC
Torque	2.08 in. oz. max.
Effective Electrical Adjust.	25 turns nominal

★All values are standard through authorized Murata Electronics Distributors.

PREFERRED TYPES

PART NO.	TOL. (%)	CONFIG.
POT3106P-1-(000)K	±10	P
POT3106W-1-(000)K	±10	W
POT3106X-1-(000)K	±10	X
POT3106Y-1-(000)K	±10	Y
POT3106Z-1-(000)K	±10	Z



These ultra small, high performance chip inductors feature a low direct current resistance and outstanding high frequency characteristics. Each series has a unique structure specifically designed with a wide range of values suitable for various applications such as CMT, pagers, radio communication equipment and audio equipment.

PACKAGING:
Taped per EIAJ-RC-1009B in plastic tape on a reel in the following quantities:
LQN1A/LQH1N/LQH1C/LQH3N/LQH3C/LQP31A/LQP21A : 2000 pcs/reel (180mm)
LQN2A : 2500 pcs/reel (180mm)
LQH(N)4N : 2500 pcs/reel (330mm)
LQM32C : 1000 pcs/reel (180mm)
LQS33N : 1000 pcs/reel (180mm)
LQG21N : 4000 pcs/reel (180mm)

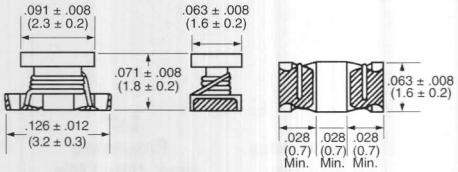
PART NUMBERING

LQP 31 A 6N8 J 04 M00

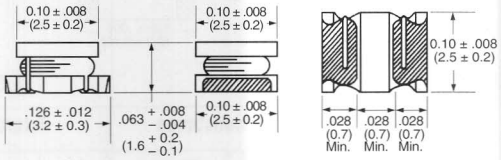
Type	Size	Core Material	Inductance Code	Tolerance	Electrode Material	Marking
LQN LQP	1 2 21 31	A: Alumina Core	6N8: 6.8nH 221: 220nH	**J** = ±5% **K** =±10% **M**=±20%	04: NI Alloy Metalization	M00=Not Marked M01=Marked

LQN1A/LQN2A SERIES – HIGH Q, FOR HIGH FREQUENCY

DIMENSIONS: in. (mm)



LQN1A

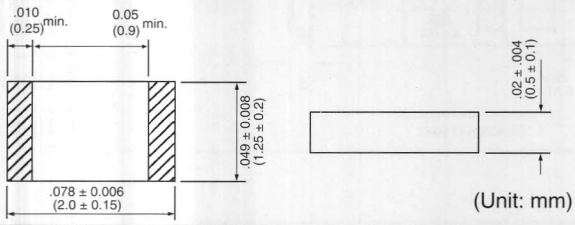


LQN2A

Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] J	Tolerance[3] K	Tolerance[3] M	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
★LQN1A○○○□04M00	8.8nH	100nH	◎	○		100	0.029±40%	1000	750
★LQN2A○○○□04M00	10nH	82nH			◎	60	0.25	1000	750
	100nH	220nH		◎		40	0.40	400	380

1···Inductance code is shown in ○○○: 4.7nH=4N7, 10nH=10N, 100nH=R10
2···Tolerance code is shown in □ : ±5%=J, ±10%=K, ±20%=M
3···◎: Standard ○: Semi Standard
4···DC resistance, self-resonant frequency and allowable current are shown with the minimum value of inductance.

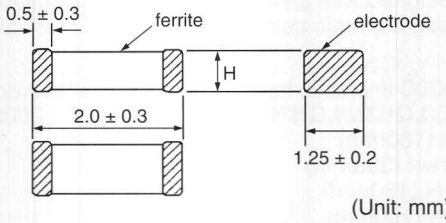
LQP21A SERIES – SMALL SIZE FOR ULTRA HIGH FREQUENCY



Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] J	Tolerance[3] K	Tolerance[3] M	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
★LQP21A○○○□04	3.3nH	15nH	◎			44	1	2000	100

1···Inductance code is shown in ○○○: 3.3nH=3N3, 15nH=15N.
2···Tolerance code is shown in □ : ±5%=J.
3···◎: Standard.
4···DC resistance and self-resonant frequency are shown with minimum value of inductance.
★Available as standard through authorized Murata Electronics Distributors.

★LQG21N SERIES – MONOLITHIC SHIELDED INDUCTOR



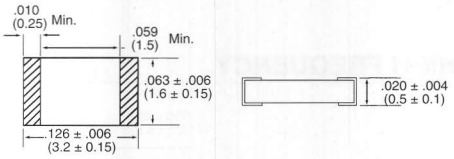
Inductance	H
~2.2μH	0.9 ± 0.2
2.7μH~	1.25 ± 0.2

(Unit: mm)

Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] J	Tolerance[3] K	Tolerance[3] M	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
★LQG21N○○○□04	0.10μH	4.7μH		◎		25	0.17±50%	340	300

1···Inductance code is shown in ○○○: .10μH=R10, 4.7μH=4R7.
2···Tolerance code is shown in □: ±10K.
3···◎: Standard.
4···DC resistance, self-resonant frequency and allowable current are shown with minimum value of inductance.
★Available as standard through authorized Murata Electronics Distributors.

LQP31A SERIES – TIGHT TOLERANCE FOR ULTRA HIGH FREQUENCY

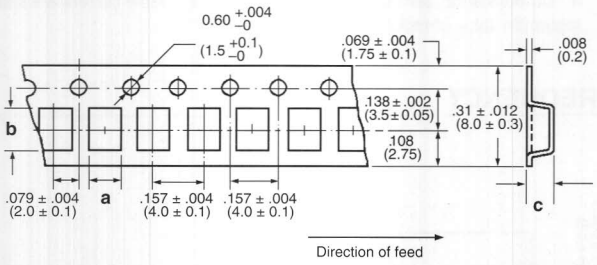


DIMENSIONS: in. (mm) **LQP31A**

Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] G	Tolerance[3] J	Tolerance[3] K	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
LQP31A○○○□04M000	4.7nH	6.8nH		◎		50	1	2000	250
	10nH	100nH	◎			30	1	1000	230

1···Inductance code is shown in ○○○○: .4.7nH=4N7, 10nH=10N, 100nH=R10
2···Tolerance code is shown in □: ±5%=J, ±10%=K, ±20%=M.
3···◎: Standard ○ : Semi Standard.
4···DC resistance, self-resonant frequency and allowable current are shown with the minimum value of inductance.

DIMENSIONS OF PLASTIC TAPE: in. (mm)



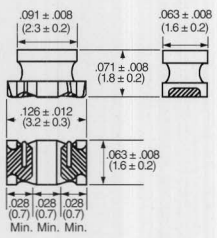
Part Number	a	b	c
LQN1A	.075 (1.9)	.142 (3.6)	.079 (2.0)
LQN2A	.114±.008 (2.9±0.2)	.142±.008 (3.6±0.2)	.071 (1.8)
LQP21A	.06 (1.55)	.09 (2.3)	.03 (.75)
LQG21	.06 (1.55)	.09 (2.3)	.05 (1.3 max)
LQP31A	.075 (1.9)	.142 (3.6)	.035 (0.9)

PART NUMBERING SYSTEM

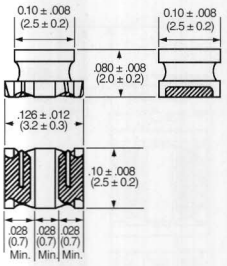
LQH	3	C	102	K	04	M00
Type **LQH**=Epoxy Coated **LQN**=Non-Coated **LQG**=Mono **LQS**=Shielded	**Size** 1 2 3 4	**Core Material** A: Alumina Core N: Ferrite Core C: Ferrite Core for choke coil	**Inductance Code** 1R0=1.0μH 100=10μH 331=330μH	**Tolerance** **G**=±2% **J**=±5% **K**=±10% **M**=±20%	**Electrode Material** 00: Metal 04: NI Alloy Metalization	**Marking** M01=Marked M00=Not Marked

STANDARD TYPE LQH/LQN□N SERIES

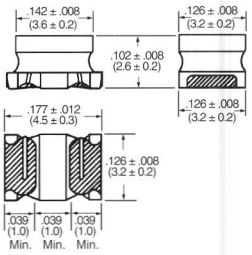
DIMENSIONS: in. (mm)



LQH1N



LQH3N

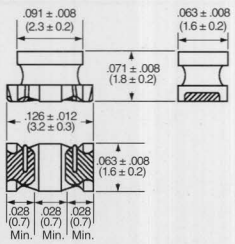


LQH4N/LQN4N

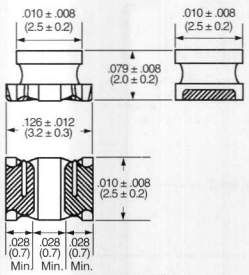
Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] J	Tolerance[3] K	Tolerance[3] M	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
★LQH1N○○○□04M00	0.15μH	8.2μH		○	◎	50	0.39±40%	250	250
	10μH	100μH	○	◎		60	2.5 ±30%	20	100
★LQH3N○○○□04M00	0.1μH	0.82μH			◎	50	0.25	200	700
	1.0μH	8.2μH			◎	50	0.5	100	445
	10μH	330μH	○	◎		60	1.8	20	190
★LQH4N○○○□04M00	10μH	1.5mH	○	◎		50	0.56	23	400
★LQN4N○○○□04M00	1.8mH	2.2mH	○	◎		50	45	1.5	35

1···Inductance code is shown in ○○○: 1.2μH=1R2, 10μH=100, 100μH=101
2···Tolerance code is shown in □: ±5%=J, ±10%=K, ±20%=M
3···◎: Standard ○: Semi Standard.
4···DC resistance, self-resonant frequency and allowable current are shown with the minimum value of inductance.

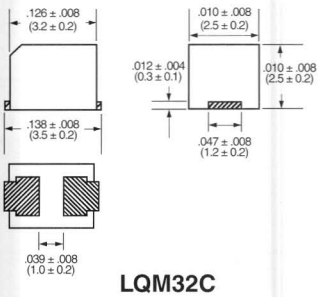
LQH□C/LQM32C SERIES – FOR CHOKE COIL USE, LARGE ALLOWABLE CURRENT, LARGE INDUCTANCE



LQH1C



LQH3C



LQM32C

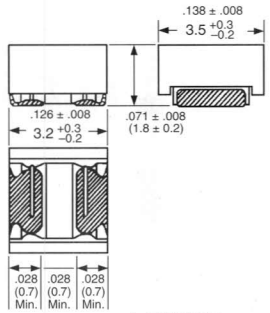
DIMENSIONS: in. (mm)

Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] J	Tolerance[3] K	Tolerance[3] M	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current(mA)
★LQH1C○○○□04M00	0.12μH	4.7μH			◎	0.08±40%	250	970
	10μH	100μH		◎		1.3 ±30%	20	230
★LQH3C○○○□04M00	1.0μH	4.7μH			◎	0.09±30%	96	800
	10μH	330μH		◎		0.44±30%	26	300
★LQM32C○○○□00M00	470μH	1000μH			◎	13 ±30%	4.5	80

1···Inductance code is shown in ○○○: 1.2μH=1R2, 10μH=100, 100μH=101
2···Tolerance code is shown in □: ±5%=J, ±10%=K, ±20%=M
3···◎: Standard ○: Semi Standard
4···DC resistance, self-resonant frequency and allowable current are shown with the minimum value of inductance.

★Available as standard through authorized Murata Electronics Distributors.

LQS33N SERIES – TIGHT TOLERANCE WITH MAGNETIC SHIELD

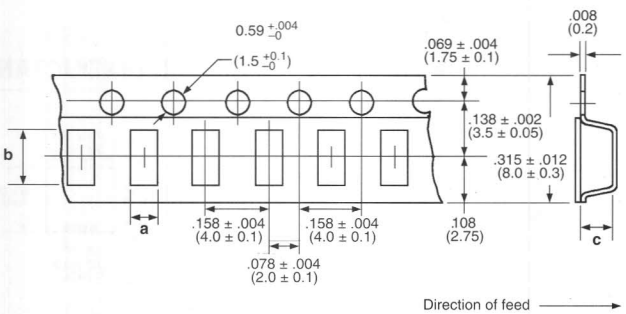


DIMENSIONS: in. (mm) **LQS33N**

Part Number[1,2]	Nominal Inductance Min.	Nominal Inductance Max.	Tolerance[3] G	Tolerance[3] J	Tolerance[3] K	Q (Typ.)	DC[4] Resistance (Ω) Max.	Self[4] Resonance Freq. (MHz) Min.	Allowable[4] Current (mA)
LQS33N○○○□04M00	1.0μH	100μH	◎	○		100	0.19±30%	120	70

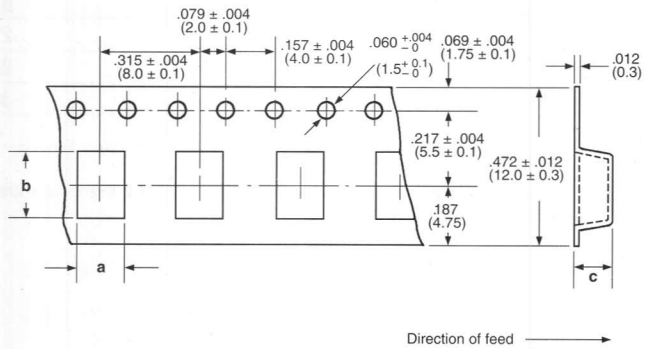
1···Inductance code is shown in ○○○ : 1.2μH=1R2, 10μH=100, 100μH=101
2···Tolerance code is shown in □ : ±2%=G, ±5%=J, ±10%=K
3···◎: Standard ○ : Semi Standard.
4···DC resistance, self-resonant frequency and allowable current are shown with the minimum value of inductance.

DIMENSIONS OF PLASTIC TAPE: in. (mm)



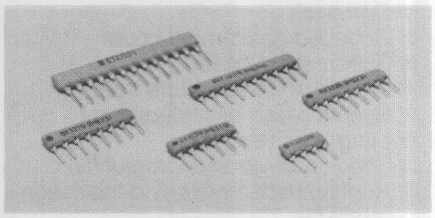
Part Number	a	b	c
LQH1N/LQH1C	.075 (1.9)	.142 (3.6)	.079 (2.0)
LQH3N/LQH3C	.114±.008 (2.9±0.2)	.142±.008 (3.6±0.2)	.087 (2.2)
LQM32C	.114 (2.9)	.157 (4.0)	.110 (2.8)

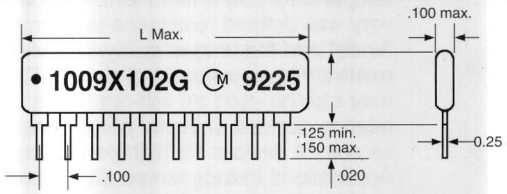
DIMENSIONS OF PLASTIC TAPE: in. (mm)



Part Number	a	b	c
LQS33N	0.10 (3.9)	.146 (3.7)	.075 (1.9)
LQH4N/LQN4N	.142 (3.6)	.193 (4.9)	.114 (2.9)

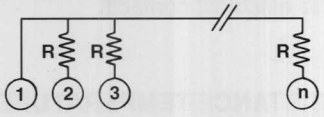
SIP RESISTOR NETWORKS





RSL H = .200 1/8W
RSC H = .256 1/8W
RSH H = .355 1/4W
MARKING: Pin 1 Location
No. of Pins
No. of Resistors
Circuit Type
Res. Value Code
Tolerance
Data Code (Yr, Wk)

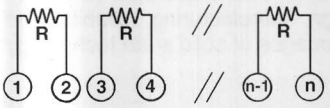
X-CIRCUIT–PARALLEL



13 Elements Max. N = Pins 4 through 14

No. Pins	No. of Elements	L
4	3	.398
5	4	.496
★6	5	.594
7	6	.693
★8	7	.795
9	8	.894
★10	9	.996
11	10	1.094
12	11	1.201
13	12	1.299
14	13	1.398

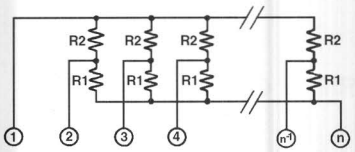
Y-CIRCUIT–DISCRETE



7 Elements Max. N = 6, 8, 10, 12 and 14 Pins

No. Pins	No. of Elements	L
★6	3	.594
★8	4	.795
★10	5	.996
12	6	1.201
14	7	1.398

Z-CIRCUIT–DOUBLE TERMINATION



16 Elements Max. N = 6, 7, 8, 9 and 10 Pins

No. Pins	No. of Elements	L
6	8	.594
7	10	.693
8	12	.795
9	14	.894
10	16	.996

PART NUMBERING SYSTEM

RSL 06 X 102 G

- **RSL** — **Single In-Line Resistor Network**
  RSL = 1/8 W
  RSC = 1/8 W (Y&L circuits only)
  RSH = 1/4 W
- **06** — **No. of Pins**
- **X** — **Circuit Type**
  X = Parallel
  Y = Discrete
  Z = Double Termination
- **102** — **Resistance Code**
  First two digits are significant. Last indicates number of zeros.
- **G** — **Resistance Tolerance**
  F = ±1%
  G = ±2%
  J = ±5%

TYPICAL RESISTANCE COMBINATIONS*

R_1/R_2	R_1/R_2	R_1/R_2
160/240	330/390	330/390
180/390	330/470	1.5K/3.3K
220/330	330/680	3K/6.2K

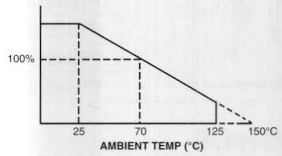
***Note 1:** In addition to R_1=R_2 resistance combinations, the typical resistor combinations shown in the chart are available.
2: RC networks are also available. Contact Murata Electronics for technical details.

SPECIFICATIONS

Electrical

Temp. Range:	–55°C to +125°C
Resistance Range:	22Ω to 1MΩ
Resistance Tolerance:	±1% (F), ±2% (G), ±5% (J)
Temp. Coefficient:	±200 ppm/°C max. (±100ppm/°C max. on special order)
Power:	100% at 70°C Maximum ambient temperature at 0 watt is 125°C

Power Derating Characteristics:



Mechanical

Substrate Material:	Alumina
Resistor Material:	Cermet, thick film
Lead Pull Strength:	2 lbs.
Coating:	Meets UL94V-0 standards

Note: Other types and custom designs are also available.

COMMON SIZES/TOLERANCE

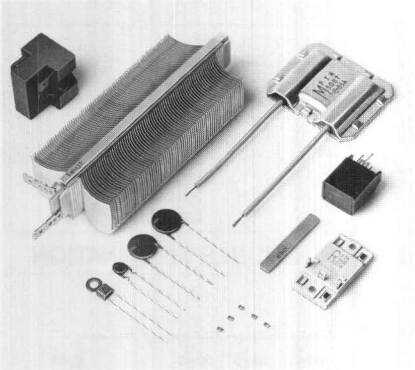
Part No.	Tol. (%)	Part No.	Tol. (%)
RSL(Low Profile) 1/8 W		**RSH 1/4 W**	
★RSL06X(000)G	±2	★RSH06X(000)G	±2
★RSL08X(000)G	±2	★RSH08X(000)G	±2
★RSL10X(000)G	±2	★RSH10X(000)G	±2
RSL06X(000)J	±5	RSH06X(000)J	±5
RSL08X(000)J	±5	RSH08X(000)J	±5
RSL10X(000)J	±5	RSH10X(000)J	±5
★RSL06Y(000)G	±2	**RSC 1/8 W**	
★RSL08Y(000)G	±2	★RSC06Y(000)G	±2
★RSL10Y(000)G	±2	★RSC08Y(000)G	±2
RSL06Y(000)J	±5	★RSC10Y(000)G	±2
RSL08Y(000)J	±5	RSC06Y(000)J	±5
RSL10Y(000)J	±5	RSC08Y(000)J	±5
		RSC10Y(000)J	±5

PREFERRED VALUES

Res.(ohms)	Code	Res.(ohms)	Code	Res.(ohms)	Code	Res.(ohms)	Code	Res.(ohms)	Code	Res.(ohms)	Code	Res.(ohms)	Code
22	220	110	111	510	511	2400	242	11000	113	51000	513	240000	244
24	240	120	121	560	561	2700	272	12000	123	56000	563	270000	274
27	270	130	131	620	621	3000	302	13000	133	62000	623	300000	304
30	300	150	151	680	681	3300	332	15000	153	68000	683	330000	334
33	330	160	161	750	751	3600	362	16000	163	75000	753	360000	364
36	360	180	181	820	821	3900	392	18000	183	82000	823	390000	394
39	390	200	201	910	911	4300	432	20000	203	91000	913	430000	434
43	430	220	221	1000	102	4700	472	22000	223	100000	104	470000	474
47	470	240	241	1100	112	5100	512	24000	243	110000	114	510000	514
51	510	270	271	1200	122	5600	562	27000	273	120000	124	560000	564
56	560	300	301	1300	132	6200	622	30000	303	130000	134	620000	624
62	620	330	331	1500	152	6800	682	33000	333	150000	154	680000	684
68	680	360	361	1600	162	7500	752	36000	363	160000	164	750000	754
75	750	390	391	1800	182	8200	822	39000	393	180000	184	820000	824
82	820	430	431	2000	202	9100	912	43000	433	200000	204	910000	914
91	910	470	471	2200	222	10000	103	47000	473	220000	224	1000000	105
100	101												

★Available as standard through authorized Murata Electronics Distributors.

POSISTORS®
HIGH POWER PTC THERMISTORS



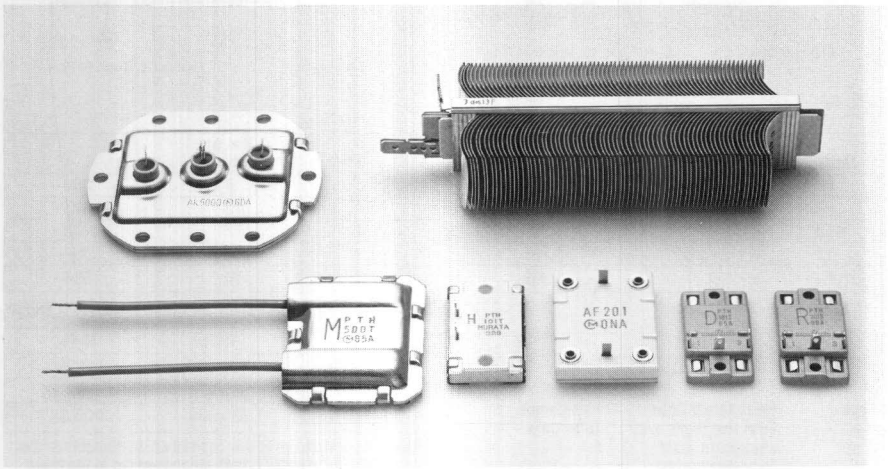
Murata Electronics Posistors are positive temperature coefficient thermistors with a very well defined resistance-temperature "knee" and the unique ability to "switch" relatively large amounts of power. They may also be used as self-regulating heating devices at useful power levels and as control devices for high power heaters. Applications include temperature sensing, over temperature and over current protection and motor starting to name a few.

Products utilizing Posistors are extremely safe and reliable and offer all of the design, manufacturing, reliability and sales advantages of solid state technology.

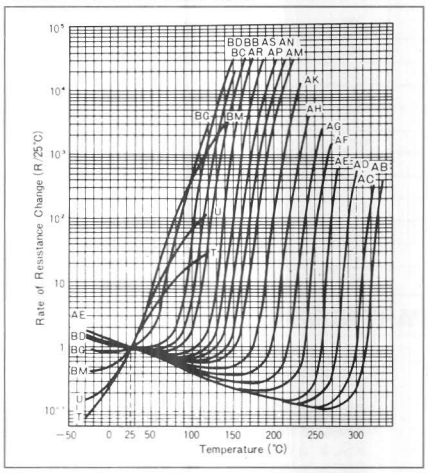
FEATURES

- Compact
- Reduced component count
- Extremely reliable
- "Stepless" temperature control
- Simple repair or replacement
- Long term reliability
- Shock and vibration immunity
- Nonflammable case and insulation available
- No electrical or acoustical noise
- No electrical contacts

VARIETY OF HEATERS

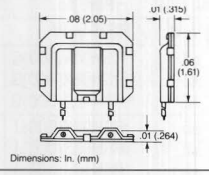
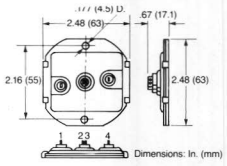


RESISTANCE-TEMPERATURE CHARACTERISTICS



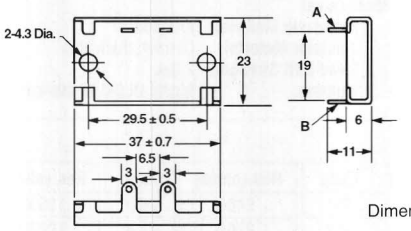
HIGH POWER FLAT HEATERS – PTH497

UL RECOGNIZED (E59464)

PTH497A	PTH497B	Part Number	Curie Point	Max. Voltage (Vrms)	Max. Power (Nominal Value) (W)
		PTH497A10BF101Q140	BF (60°C)	140	to 30
		PTH497A10BB101Q140	BB (100°C)		50
		PTH497A10AM101Q140	AM (160°C)		100
		PTH497B10BB500Q140	BB (100°C)	140	100
		PTH497B10AS500Q140	AS (130°C)		120
		PTH497B10AK500Q140	AK (180°C)		250

CONSTANT TEMPERATURE HEATERS - PTH476

PTH476



Dimensions: in. (mm)

Part Number	Curie Point	Resistance Value (Ω)	★Steady State Current(mA)	Max. Volt.	Nominal Surface Temp.
PTH476 B02 BE 500T 140 (201T 260)	BE(70°C)	50~600(200~1200)	23.0(14)± 20%	140V(260V)	80°C
PTH476 B02 BC 500T 140 (201T 260)	BC(90°C)		24.0(17)± 20%		100°C
PTH476 B02 AR 101T 140 (201T 260)	AR(120°C)	100~600(200~1200)	29.0(18)± 20%		120°C
PTH476 B02 AS 101T 140 (201T 260)	AS(130°C)		33.0(20)± 20%		130°C
PTH476 A02 AM 101T 140 (201T 260)	AM(160°C)	100~600(200~1200)	45.0(27)± 20%	140V(260V)	155°C
PTH476 A02 AK 101T 140 (201T 260)	AK(180°C)		51.5(31)± 20%		165°C
PTH476 A02 AH 101T 140 (201T 260)	AH(200°C)		58.0(35)± 20%		185°C
PTH476 A01 AG 101T 140 (201T 260)	AG(220°C)		65.0(39)± 20%		205°C

POSISTORS®
POSITIVE TEMPERATURE COEFFICIENT (PTC) THERMISTORS

To meet specific application requirements for a positive temperature coefficient Posistor for heating, circuit protection or temperature/current regulation,

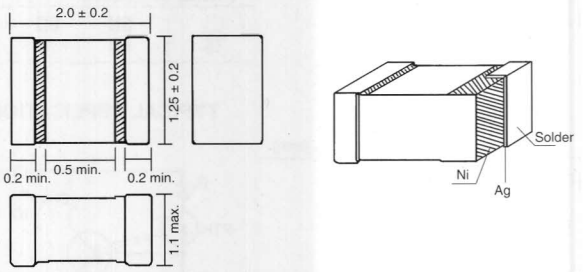
Murata Electronics offers a variety of custom pellets. Our application engineers will provide product design assistance whenever required.

OVERHEAT PROTECTORS – SURFACE MOUNT

DIMENSIONS: in. (mm)

Chip PTC Themistor, PTH9C22 Series, is a SMD Posistor developed for overheat protection of power transistors, power diodes and power ICs of hybrid circuits as temperature sensors.

0805 PACKAGE



FEATURES

- The PTH9C22 Series is a surface mount type, has compact and light design, and is suitable for the miniaturization of circuits.
- Excellent thermal response because of no coating.
- Elements of solid-state construction provides excellent mechanical vibration and impact resistance.
- Contactless operation provides prolonged service life and noiseless operation.

RATINGS

Part Number	Temp. Char. (C.P.) (°C)	Resistance Value (at 25°C)	Temp. (°C) (at 4.7kΩ)	Max. Volt.	Max. Current	Temp. Extent to (°C)
PTH9C22AR471Q-T	AR (120)	470Ω ± 50%	135 ± 10	16V	30mA	–20 to +150°C
PTH9C22BB471Q-T	BB (100)		115 ± 10			–20 to +130°C
PTH9C22BD471Q-T	BD (80)		95 ± 10			–20 to +110°C

–T: Taping (Standard quantity is 4000pcs. per reel)

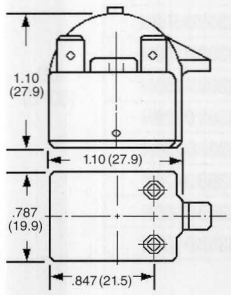
MOTOR STARTING – U.L. FILE NO. E60216

DIMENSIONS: in. (mm)

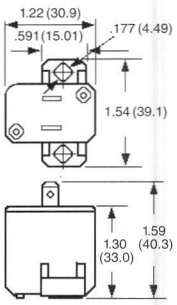
Murata Posistors are designed to provide a smooth, solid state electronic starting device for single-phase motors utilizing a split-phase starting winding or for PSC motors as a direct replacement for starting capacitors and switches. In certain applications, using a posistor in place of various capacitor/relay starting circuits can increase starting torque.

Type	Resistance (Ω)	Inrush Current (A)	Max. Voltage (V)
PTH490	3.3-33	7-12	160-300
PTH491	3.3-47	7-15	160-500

PTH490



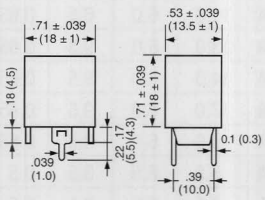
PTH491



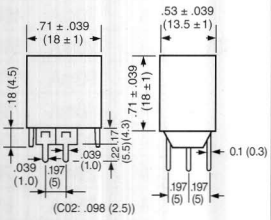
DEGAUSSING FOR COLOR TV AND DATA TERMINAL DISPLAYS

DIMENSIONS: in. (mm)

PTH451A



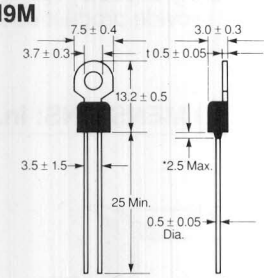
PTH451C



Part Number	Rated Voltage (V)	Min. Inrush Current (Ap-p)	Max. Steady State Current (mAp-p)	Degauss Coil R (Ω)
PTH451A100BG5R0M140	100/120	36Ap-p min.	70mAp-p max.	1
PTH451A103BG8R0M140	100/120	16Ap-p min.	15mAp-p max.	6
PTH451A102BF140M270	220/240	25Ap-p min.	40mAp-p max.	10
PTH451A102BG180N270	220/240	25Ap-p min.	35mAp-p max.	8
PTH451C260BF5R0M140	100/120	35Ap-p min.	15mAp-p max.	1
PTH451C263BG8R0M140	100/120	16Ap-p min.	7mAp-p max.	9
PTH451C262BF140M270	220/240	25Ap-p min.	25mAp-p max.	10
PTH451C262BG180N270	220/240	15Ap-p min.	15mAp-p max.	13

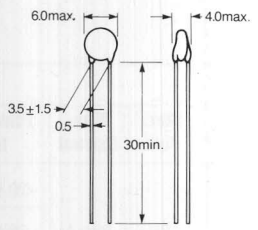
PTH9M/59F SERIES FOR POWER TRANSISTOR OVERHEAT PROTECTION

PTH9M



Dimensions: in. (mm)

PTH59F

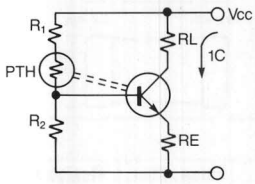


Dimensions: in. (mm)

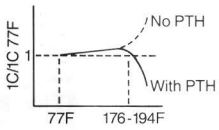
Part Number	Resistance 25 (°C)	Resistance TS-10 (°C)	Resistance TS (°C)	Max. Voltage	Max. Current	Dielectric WSV
*PTH9M04□471TS2F333	100 Ω max.	330 Ω max.	470 Ω min.	16V	0.1A	500 VDC for 5 seconds
PTH59F04□471TS						
PTH9M04□222TS2F333	330 Ω max.	1.5 Ω max.	2.2 Ω min.	16V	0.1A	
*PTH59F04□222TS						

□ :	BH	BG	BF	BE	BD	BC	BB
TS :	60	70	80	90	100	110	120

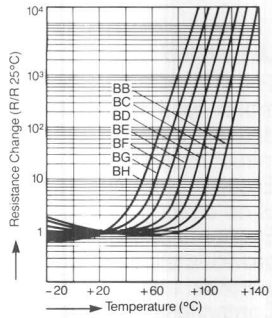
TYPICAL APPLICATION



IC VS. TEMPERATURE

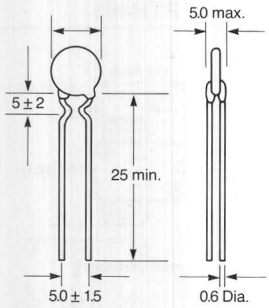


RESISTANCE-TEMPERATURE CHARACTERISTIC



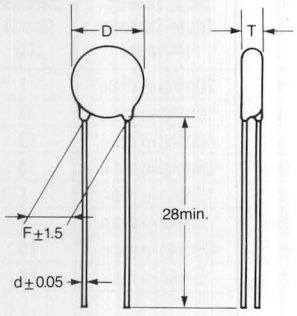
PTH60/61G SERIES FOR IC AND TRANSISTOR CIRCUIT PROTECTION

Dimensions: mm
PTH60: 7.4 max.
PTH61: 9.6 max.



Part Number	Char. (Curie Point)	Resistance (Ω)	Max. Volt. (V)	Max. Current (A)	Non-Operating Current (mA)	Trip Current (mA)
PTH61G30BD2R2N	BD (80°C)	2.2±30%	24	2.0	180	710
PTH61G30BD3R3N		3.3±30%			145	580
PTH61G30BD4R7N		4.7±30%			115	460
PTH60G30BD6R8N		6.8±30%			90	370
PTH60G30BD100N		10±30%			80	320
PTH60G30BD150N		15±30%	32	1.5	60	240
PTH60G30BD220N		22±30%			45	200
PTH60G30BD330N		33±30%			40	170
PTH60G30BD470N		47±30%			30	140
PTH60G30BD680N		68±30%			28	120
PTH60G30BD101N		100±30%			25	100

PTH60H01-PTH63H02 SERIES FOR LINE VOLTAGE OR TRANSFORMER PROTECTION

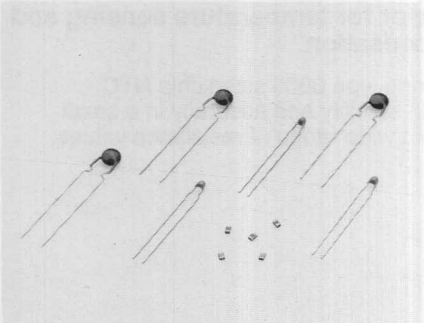


Part Number	Char. (Curie Point)	Resistance Range (at 25°C)	Max. Volt.	Max. Current	Non-Operating Current*	Trip Current **	Dimensions: mm D Max.	T Max.	F	d
*PTH60H01AR330M140	AR (120°C)	33Ω±20%	140V	0.5A	100mA	230mA	7.4	6.0	5.0	0.5
*PTH61H01AR220M140		22Ω±20%		1.0A	140mA	330mA	9.6	6.0	6.5	0.65
*PTH624H01AR150M140		15Ω±20%		1.0A	170mA	400mA	11.6	6.0	6.5	0.65
*PTH623H01AR100M140		10Ω±20%		1.0A	220mA	510mA	13.0	6.0	9.5	0.65
*PTH622H01AR6R8M140		6.8Ω±20%		1.0A	290mA	670mA	14.0	6.0	9.5	0.65
*PTH631H01AR5R6M140		5.6Ω±20%		2.0A	340mA	780mA	17.0	6.0	9.5	0.65
*PTH63H01AR4R7M140		4.7Ω±20%		2.0A	390mA	900mA	19.0	6.0	9.5	0.65
*PTH59H02AR181M265		180Ω±20%	265V	0.3A	29mA	70mA	6.5	6.5	3.5	0.5
*PTH59H02AR121M265		120Ω±20%		0.3A	35mA	85mA	6.5	6.5	3.5	0.5
*PTH60H02AR820M265		82Ω±20%		0.5A	60mA	150mA	8.2	6.5	5.0	0.5
*PTH60H02AR560M265		56Ω±20%		0.8A	80mA	190mA	8.2	6.5	5.0	0.5
*PTH61H02AR390M265		39Ω±20%		1.2A	100mA	240mA	10.0	6.5	6.5	0.65
*PTH623H02AR270M265		27Ω±20%		1.5A	150mA	360mA	14.0	6.5	9.5	0.65
*PTH62H02AR180M265		18Ω±20%		1.8A	180mA	440mA	15.7	6.5	9.5	0.65
*PTH63H02AR120M265		12Ω±20%		2.0A	255mA	610mA	19.5	6.5	9.5	0.65

U.L. Recognized (E78831) *@+60°C **@−10°C

*Available through authorized Murata Electronics Distributors.

NTC THERMISTORS



The NTH5D and NTH4G Series of NTC thermistors provides a wide range of resistances and B-Constants.

This makes them perfect for use in various applications as devices for temperature sensors and temperature compensation.

NTH5G surface mount device is also available. Call for details.

FEATURES

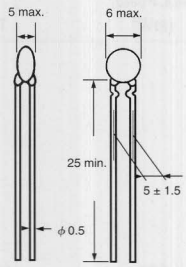
- Thermally stable with consistent performance
- Very low deviation in temperature index
- Highly reliable
- Specifications and standards can be applied to meet any application and purpose

APPLICATIONS

- Temperature compensation of transistor IC circuits
- Temperature compensation of measuring equipment and various circuits
- Temperature sensor and temperature control for home appliances

DIMENSIONS & SPECIFICATIONS

Dimensions: mm



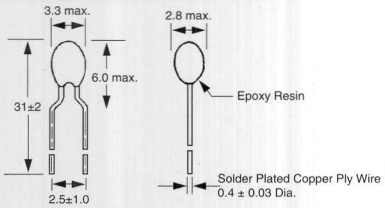
Part Number	Resistance 25°C(Ω)	B-Constant 25/50°C(°K)	Resist.Temp.Coeff. 25/50°C(%/°C)	Part Number	Resistance 25°C(Ω)	B-Constant 25/50°C(°K)	Resist.Temp.Coeff. 25°C(%/°C)
NTH5D221KA	220	3,300	−3.7	NTH5D682KA	6,800	4,100	−4.6
NTH5D331KA	330	3,300	−3.7	NTH5D103KA	10,000	4,100	−4.6
NTH5D471KA	470	3,500	−3.9	NTH5D153KA	15,000	4,100	−4.6
NTH5D681KA	680	3,500	−3.9	NTH5D223KA	22,000	4,200	−4.7
NTH5D102KA	1,000	3,800	−4.3	NTH5D333KA	33,000	4,200	−4.7
NTH5D152KA	1,500	3,800	−4.3	NTH5D473KA	47,000	4,200	−4.7
NTH5D222KA	2,200	3,900	−4.4	NTH5D683KA	68,000	4,400	−4.9
NTH5D332KA	3,300	3,900	−4.4	NTH5D104KA	100,000	4,400	−4.9
NTH5D472KA	4,700	3,900	−4.4	NTH5D154KA	150,000	4,400	−4.9

- B-constant deviation : ±10%
- Thermal dissipation constant : 5.6 mW/°C
- Thermal Time constant : 20 sec.
- Operating temp. range : −30 to + 125°C

NTC THERMISTOR NTH4G SERIES

Miniature Thermistor for Temperature Sensor – NTH4G series is the world's smallest thermistor that is automatically processed into its radial-leaded form with our advanced production method.

RATINGS



Part Number*1	Resistance 25°C (kΩ)	B-Constant*2 25/50°C (k)	Thermal Dissipation Constant	Thermal Time Constant	Operating Temperature Range
NTH4G35A202□02	2.0	3500	2.1 (mW/°C)	1 Sec. Max. (In Liquid)	−40°C to 125°C
NTH4G37A502□02	5.0	3700			
NTH4G39A103□02	10.0	3900			
NTH4G33B103□01	10.0	3380			
NTH4G40B203□01	20.0	4050			
NTH4G41A303□01	30.0	4100			
NTH4G41B503□01	50.0	4150			
NTH4G42B104□01	100.0	4250			

*1: Letter denoting the resistance tolerance is entered into the box. (F: ±1%, E: ±3%)
*2: B-Constant Tolerance (±1%) Max. Power 210mW

GLASS ENCAPSULATED NTC THERMISTORS

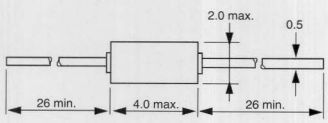
This NTC thermistor Series features chip elements for high accuracy and stability. Encapsulated in glass, these thermistors are suitable for applications demanding high reliability and/or temperature and humidity extremes.

FEATURES

- Stable performance with negligible resistance and B-constant variation
- Glass encapsulation for reliable operation in high humidity-temperature environments
- Compact, light weight, easy to handle
- Custom orders can be produced to meet specific applications

DIMENSIONS & SPECIFICATIONS

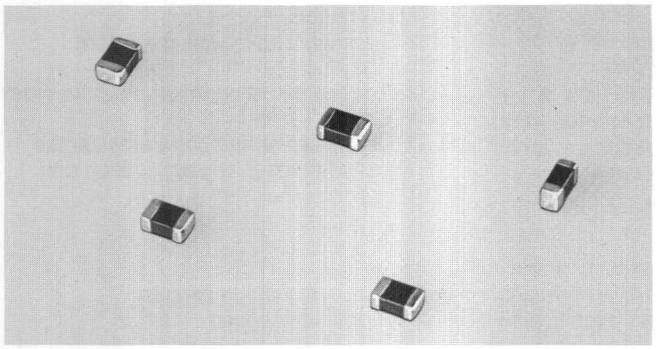
Dimensions: mm



Part Number*1	Resistance (25°C)	B-Constant*2	Thermal Dissipation Constant	Thermal Time Constant	Operating Temperature Range
NTH300XH502□01	5KΩ	3350K±3%	2.0mW/°C (Typical)	20 Seconds (Typical)	−40°C to +300°C
NTH300XK103□01	10KΩ	3400K±3%			
NTH300XQ103□01	10KΩ	3650K±3%			
NTH300XW103□01	10KΩ	3950K±3%			
NTH300XW203□01	20KΩ	3950K±3%			
NTH300XW303□01	30KΩ	3950K±3%			
NTH300WA503□01	50KΩ	4000K±3%			
NTH300WC104□01	100KΩ	4100K±3%			
NTH300WE204□01	200KΩ	4200K±3%			

*1: Letter denoting the resistance tolerance is entered into the box. (K: ±10%, J: ±5%, E: ±3%)
*2: Denotes the value obtained from the resistance at 25 and 50°C.

CHIP NTC THERMISTOR
NTH5G Series

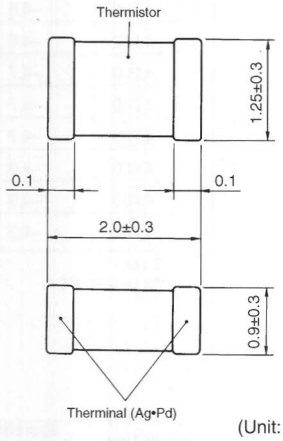


Chip NTC Thermistor for temperature sensing and temperature compensation

NTH5G, reflow soldering type 0805 sized chip NTC Thermistor, offers high stability and accuracy in a small package. Available in a wide range of resistance values.

RATINGS

DIMENSIONS: in. (mm)



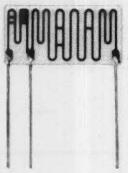
(Unit: mm)

Part Number*1	Resistance 25°C	B-constant 25/50°C(K)*2	Max.Power (mW)	Operating Temp. Range
NTH5G29A221□01TE	220 Ω	2900		
NTH5G29A331□01TE	330 Ω	2900		
NTH5G29B471□01TE	470 Ω	2950		
NTH5G29B681□01TE	680 Ω	2950		
NTH5G30A102□01TE	1.0KΩ	3000		
NTH5G39B152□01TE	1.5KΩ	3950		
NTH5G39B222□01TE	2.2KΩ	3950		
NTH5G39B332□01TE	3.3KΩ	3950		
NTH5G35A472□01TE	4.7KΩ	3500	200	−40~ +125°C
NTH5G36B682□01TE	6.8KΩ	3650		
NTH5G36B103□01TE	10.0KΩ	3650		
NTH5G39B153□01TE	15.0KΩ	3950		
NTH5G39B223□01TE	22.0KΩ	3950		
NTH5G40B333□01TE	33.0KΩ	4050		
NTH5G40B473□01TE	47.0KΩ	4050		
NTH5G41B683□01TE	68.0KΩ	4150		
NTH5G42B104□01TE	100.0KΩ	4250		

*1 Resistance tolerance (J: ±5%, K: ±10%)
*2 B-constant tolerance ±3%
Supplied on tape (Standard qty. is 4000 pcs./reel)

HIGH VOLTAGE RESISTOR MHR SERIES

P Type



F Type

Part Number	Size W×L(m)	E max (KV)	P max (W)	△T (°C)	Part Number	Size W×L(m)	E max (KV)	P max (W)	△T (°C)
MHR0629	6×29	12	1.0	27.4	MHR1538	15×38	25	2.2	19.5
MHR0643	6×43	20	1.7	24.0	MHR1550	15×50	30	2.5	17.0
MHR0718	7×18	10	1.0	32.7	MHR1760	17×60	30	2.8	16.6
MHR0830	8×30	17	1.8	23.8	MHR1839	18×39	25	2.2	18.7
MHR1220	12×20	15	1.5	27.5	MHR2551	25×51	35	3.0	14.4
MHR1428	14×28	22	1.7	23.5	MHR2660	26×60	35	3.5	13.3
MHR1351	13×51	30	2.3	18.1	MHR3458	34×58	35	4.0	12.3

Remarks: 1) $E=\sqrt{PR}$ E: Rated Voltage
P: Rated Power
R: Resistance Value
2) △T: Temperature rising per 1 watt (reference value)

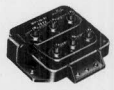
PART NUMBERING SYSTEM

MHR 25 51 P B 247 K

- MHR — TYPE
- 25 51 — DIMENSION OF SUBSTRATE (Ex. 25×51mm)
- P — P: Epoxy resin dip type; F: Epoxy resin print type
- B — CIRCUIT CONNECTION
- 247 — NOMINAL RESISTANCE
- K — RESISTANCE TOLERANCE

FOCUS ADJUSTING RESISTOR

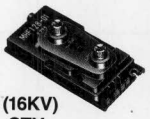
■ Focus Adjusting Resistor for Color TV-Display



MHF116 (16KV) for Projection

MHF045 (6KV) for 4″ ∿6″ CTV

MHF106 (10KV) for 14″ ∿CTV



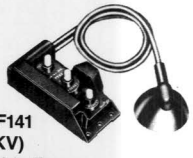
MHF128 (16KV) for 25″ ∿CTV

MHF107 (12KV) for 19″ ∿CTV

MHF002 (30KV) for Display

MHF103 (30KV) for Display (Capacitor Equipped)

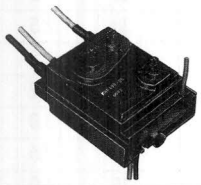
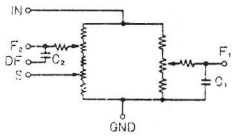
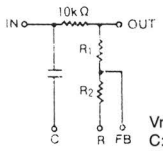
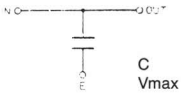
MHF115 (40KV) for Display



MHF141 (32KV) Double Focus

MHF138 (12KV) Double Focus

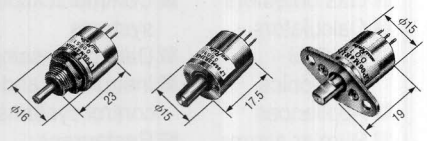
HIGH VOLTAGE CR BLOCK & MULTIPLIER

PART	CIRCUIT
MSC63 (for CRT Display) 	 Vmax: 13kVDC Rtotal: 100MΩ ± 20% C_1: 330pF ± 20% F_1 F_2 max. ≥ 89.9% F_1 F_2 min. ≤ 63.3% S max. ≥ 11.0% S min. ≤ 2.0% C_2: 470pF + 20%
MSC52-01 (for CRT Display)	 Vmax: 35kVDC C: 6500pF $R_1 + R_2$: 400MΩ $R_2/(R_1 + R_2)$: 1/2000
MSC46-01 (for Dynamic Focus)	 C : 1000pF Vmax : 15kVDC

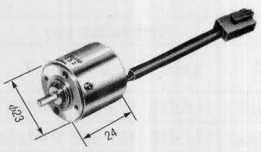
Part Number	Capacitance			Bleeder Resistor	Focus Output
	20KV	30KV	35KV		
MSC26, MSC27 MSC32, MSC33	4300pF max.	3000pF max.		—	○
MSC28, MSC29 MSC34, MSC35				○	—
MSC30, MSC31 MSC36, MSC37				—	—
MSC52, MSC53	—	6000pF max.	6000pF max.	○	—
MSC56, MSC57	—			—	—
MSC63	—	—	—	—	Dual
MSC68, MSC69	—	4500pF max.	4500pF max.	—	Dual

NON-CONTACT POTENTIOMETER

LP06M2F1AA LP06M3R1AA LP06M4R1AA



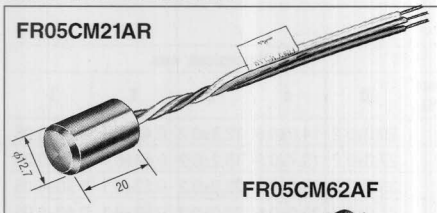
LP05D3G1AA



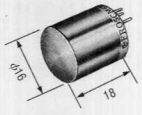
Part Number	LP06M2F1AA	LP06M3R1AA LP06M4R1AA	LP05D3G1AA
Maximum Rated Voltage (V)	6	6	5
Effective Electrical Travel (*)	±50	±50	±30
Output Sensitivity (mV/deg.)	22(Vin=6V)	22(Vin=6V)	12(Vin=5V)
Independent Linearity (%)	±1.5 max.	±1.5 max.	±1.5 max.
Temperature Characteristic of Output Voltage (%/°C)	−0.4 to −0.15	−0.4 to −0.15	±0.12
Maximum Rotation Torque (gm • cm)	0.5 max.	5 max.	5 max.
Operating Temperature Range (°C)	−10 to +60	−10 to +60	−10 to +60

ROTARY SENSOR

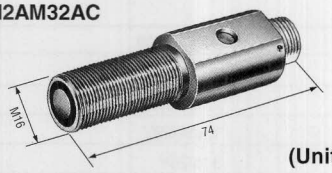
FR05CM21AR



FR05CM62AF



FR12AM32AC

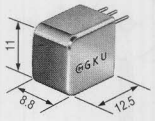


(Unit: mm)

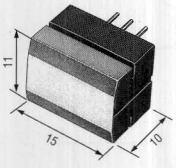
Part Number	Output Type	Rotation Detection	Linear Motion Detection	Module M	Gear Pitch (mm)
FR05CM21AR	Single phase : Analog	△	○	(0.3 to 10.) Applicable	0.7 to 3.1
FR05CM12AL	Twin phase : Analog (with Volta reference terminal)	○	△	0.4	1.3
FR05CM62AF	Twin phase : Analog	○	△	0.4	1.3
FR12AM32AC	Twin phase : Digital	△	○	0.635	2.0
FR05CM14AD	Twin dual phase : Analog	○	△	0.4	1.3

CURRENCY RECOGNITION SENSOR

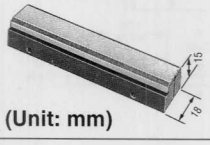
BS05N1HGAA
BS05N1HFAA



BS05i1KFAA



BS05M1HF□□

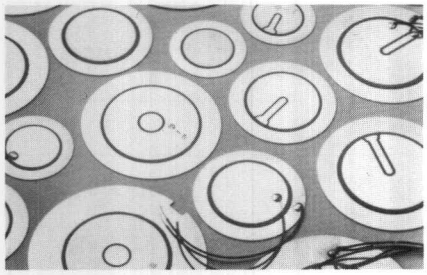


(Unit: mm)

Part Number	BS05N1HGAA	BS05N1HFAA	BS05i1KFAA	BS05M1HF□□*2
Max. Applied Voltage (V)	5	5	5	5
Output Voltage*1 (mV)	≥240	≥400	0.3 to 0.8	≥250
Sensing Track (mm)	3	3	10	3/1ch
Operating Temp. Range (°C)	−20 to 60	−20 to 60	−20 to 60	0 to 50

*1. Conforming MURATA measurement.
*2. Multi channel model with order made by each customer.

PIEZOELECTRIC ACOUSTIC ELEMENTS & ALARMS



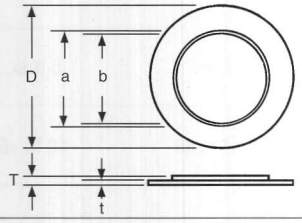
FEATURES

- Extremely clear penetrating sound
- Completely solid state
- One-tenth the power consumption of a comparable electromechanical buzzer
- No electronic noise generation
- Compact size and lightweight
- Variety of models for various tone functions

APPLICATIONS

- Fire alarms
- Gas detectors
- Calculators
- Medical electronics
- Appliances
- Burglar alarms
- Automobiles
- Aircraft
- Clocks
- Watches
- Communications systems
- Data processing
- Instrument and control systems
- Restaurant equipment
- Recreational equipment

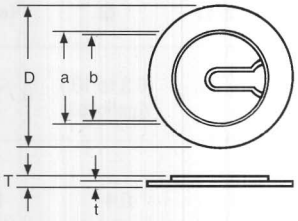
EXTERNAL DRIVE (without feedback electrode)



Part Number	Characteristics (*1,*2)			Dimensions: mm				
	Resonant frequency (KHz)	Resonant resistance (Ω)	Capacitance (pF)±30%	D	a or c	b	T	t
★7BB-20-6	6.3±0.6	≤350	10000	2.0±0.2	14.0±0.6	12.8±0.2	0.42±0.1	0.20±0.05
★7BB-27-4	4.6±0.5	≤200	20000	27.0±0.2	19.7±0.6	18.2±0.2	0.54±0.1	0.30±0.05
★7BB-35-3	2.8±0.5	≤200	10000	35.0±0.2	25.0±0.6	23.0±0.2	0.53±0.1	0.30±0.05
★7BB-41-2	2.2±0.3	≤250	30000	41.0±0.2	25.0±0.6	23.0±0.2	0.63±0.1	0.40±0.05
7NB-41-25DM-1	.85±.25	≤300	75000	41.0±0.2	25.0±0.5	23.0±0.2	0.21±0.5	0.10±0.03

*1 Insulation resistance 100MΩmin. (at 100VDC)
*2 Maximum applied voltage 30Vp-p

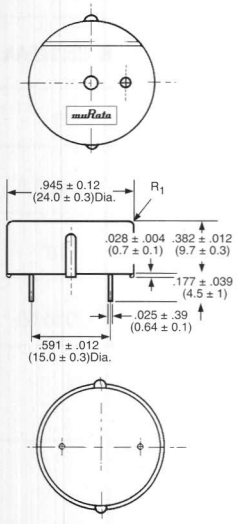
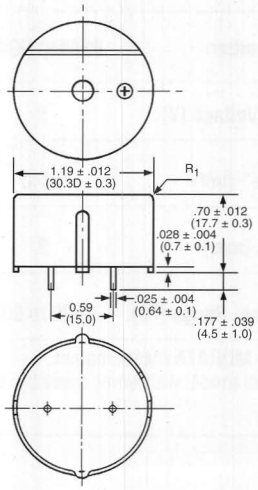
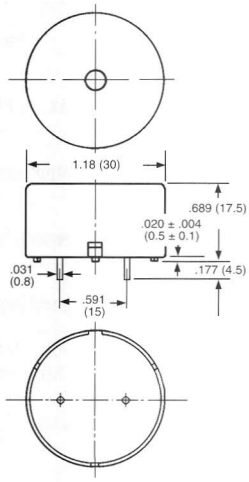
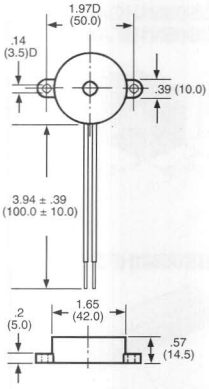
SELF-DRIVEN (with feedback electrode)



Part Number	Characteristics (*1,*2)			Dimensions: mm				
	Resonant frequency (KHz)	Resonant resistance (Ω)	Capacitance (pF)±30%	D	a	b	T	t
★7BB-20-6C	6.3±0.6	≤500	8500	20.0±0.2	14.0±0.6	12.8±0.2	0.42±0.1	0.20±0.05
★7BB-27-4C	4.6±0.5	≤200	18000	27.0±0.2	19.7±0.6	18.2±0.2	0.54±0.1	0.30±0.05
★7BB-35-3C	2.8±0.5	≤200	24000	35.0±0.2	25.0±0.6	23.0±0.2	0.53±0.1	0.30±0.05
★7BB-41-2C	2.2±0.3	≤250	24000	41.0±0.2	25.0±0.6	23.0±0.2	0.63±0.1	0.40±0.05
★7SB-34R7-3C	3.3±0.3	≤150	40000	34.7±0.2	25.0±0.6	23.4±0.2	0.50±0.1	0.25±0.05
★7SB-34R7-3C2	3.1±0.5	≤160	24000	34.7±0.2	25.0±0.6	23.0±0.2	0.50±0.1	0.25±0.05

To denote lead wire, add "A0" suffix (Ex. 7BB-20-6A0).

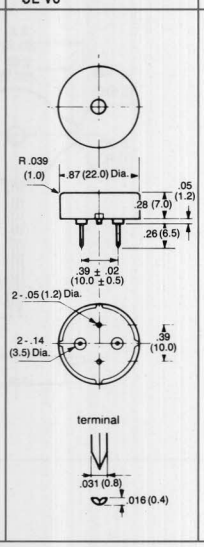
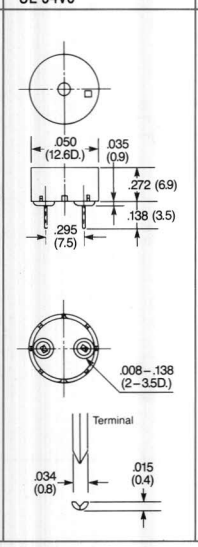
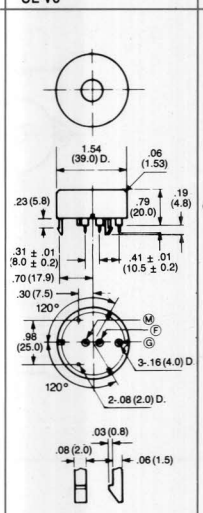
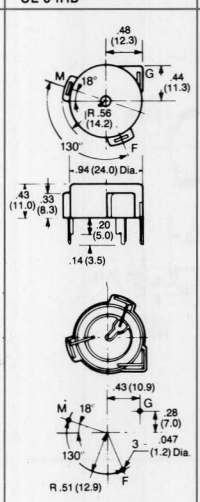
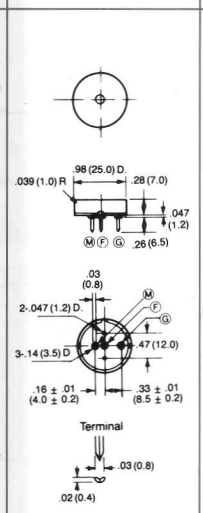
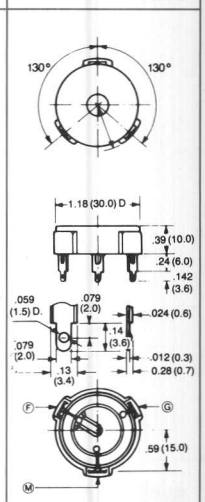
ENCASED PIEZO-ALARMS WITH INTERNAL CIRCUITRY

Part Number	★PKB24SPC-3601	★PKB30SPC-2001*	★PKB30SPC-3001	★PKB5-3A0
Sound Pressure Level	90dB@10cm@12V	75dB@1M@12V	75dB@30cm@12V	85dB@30cm@9V
Oscillating Frequency	3.6±0.5KHz	2.0±0.4KHz	2.9±0.5KHz	2.8±0.5KHz
Current	16mA@12V	15mA@12V	15mA@12V	12mA@9V
Operating Voltage	3 to 15V	3 to 15V	3 to 15V	3 to 20V
Operating Temp. Range	−20°C to +70°C	−20°C to +70°C	−20°C to +70°C	−20°C to +60°C
UL Rating	UL-94V0	UL-94V0	UL-94V0	24AWG (UL-1007)
DIMENSIONS: (mm)				

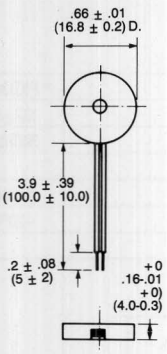
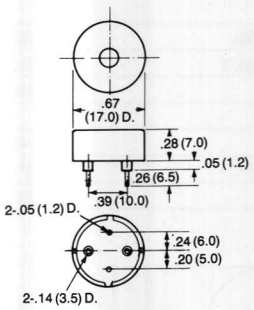
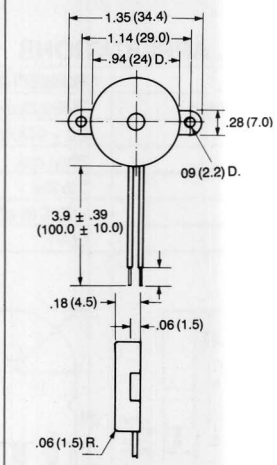
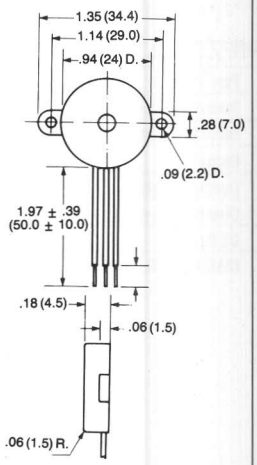
*These parts are also available as washable parts with tape covering the sound emitting hole and epoxy seal at the case bottom.
★Available as standard through authorized Murata Electronics Distributors.

PIEZOELECTRIC ACOUSTIC ALARMS

ENCASED PIEZO-ALARMS

Part Number	★PKM22EPP-4001	★PKM13EPP-4002	★PKM29-3A0	★PKM24SP-3805	★PKM25-6A0	★PKM37-2A0
Sound Pressure Level	75dB@10cm@3Vp-p	70dB@10cm@3Vp-p	85dB@9V@1M	90dB@12V@10cm	85dB@6.5V@10cm	70dB@12V@1M
Oscillating Frequency	4KHz	4.0KHz	3.4 ± 0.4KHz	3.8 ± 0.4KHz	6.8 ± 0.7KHz	2.0 ± 0.5KHz
Current	1mA@3Vp-p		20mA@9V	12mA@12V	10mA max.	15mA max.
Operating Voltage	3 to 30Vp-p	3 to 25Vp-p	4.5 to 18.0V	3 to 20V	3 to 20V	3 to 20V
Operating Temp. Range	−20°C to +70°C	−20°C to +70°C	−20°C to +70°C	−20°C to +70°C	−20°C to +70°C	−20°C to +70°C
UI Rating	UL-V0	UL-94V0	UL-V0	UL-94HB		
DIMENSIONS: (mm)						

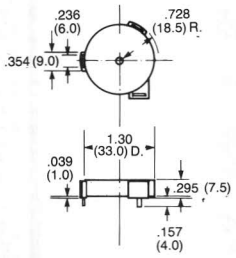
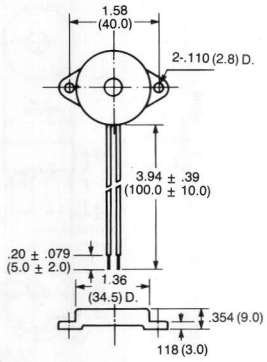
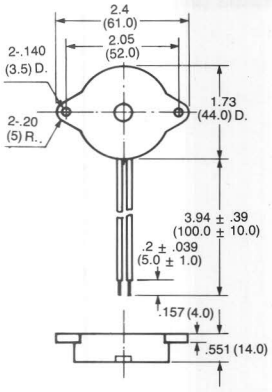
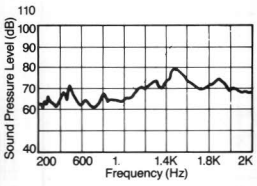
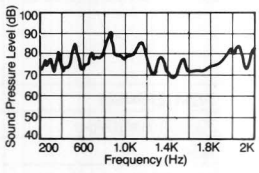
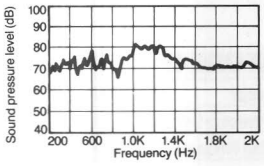
MINIATURE ENCASED PIEZO-ALARMS

Part Number	★PKM35-4A0	★PKM17EPP-4001	★PKM11-4A0	★PKM11-6A0
Sound Pressure Level	75dB@10cm@3Vp-p	72dB@10cm@3Vp-p	75dB@10cm@3Vp-p	75dB@6.5V@10cm
Oscillating Frequency	4KHz	4KHz	4096	6.5 ±0.7KHz
Current	1mA@3Vp-p	1mA@3Vp-p	1mA max.	8mA@6.5V
Operating Voltage	3 to 25Vp-p	3 to 20Vp-p	3 to 25Vp-p	3 to 15V
Operating Temp. Range	-20°C to +70°C	-20°C to +70°C	-20°C to +60°C	-20°C to +60°C
UL Rating	UL-94HB	UL-94VO	UL-V1	UL-V1
Leads	32AWG (UL-1685)		30AWG (UL-1571)	30AWG (UL-1571)
Dimensions: in (mm)				

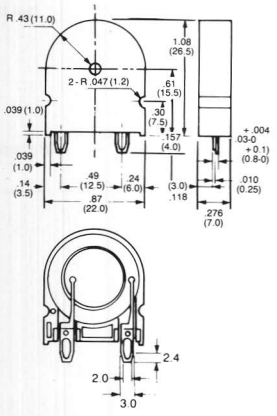
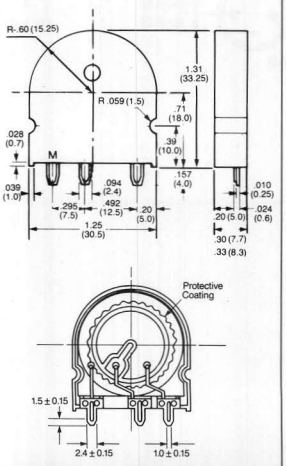
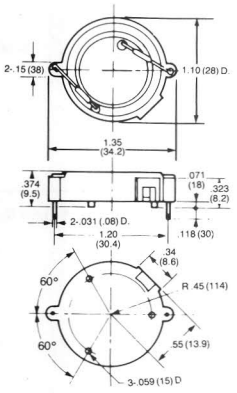
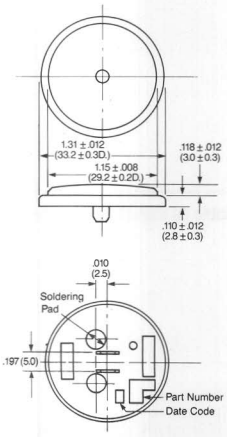
★Available as standard through authorized Murata Electronics Distributors.

PIEZOELECTRIC ACOUSTIC ALARMS

PIEZO RINGERS FOR LOW FREQUENCY APPLICATIONS

Part Number	★ PKM33EP-1001	★ PKM34EW-1101C	★ PKM44EW-1001D
Sound Pressure Level	70dB min./50cm/20Vp-p square wave at 1.0KHz	70dB min./1m/30Vp-p square wave at 1.1KHz	75dB min./30cm/9Vp-p square wave at 1.0KHz
Allowable Input	30Vp-p max.	40Vp-p max.	30Vp-p max.
Operating Temp. Range	−20°C to +70°C	−20°C to +70°C	−30°C to +70°C
Lead Wire		30 AWG UL-1571	28 AWG UL-1685
DIMENSIONS: in. (mm)			
SOUND PRESSURE LEVEL VS. FREQUENCY CHARACTERISTICS	 Input Voltage: 20.0Vp-p Square Wave Distance: 50.0cm	 Input Voltage: 30.0Vp-p Square Wave Distance: 1m	 Input Voltage: 9.00Vp-p Square Wave Distance: 30.0cm

PIEZO-ALARMS FOR SPECIAL APPLICATIONS

Part Number	★ PKM22EPT-2001	★ PKM30SPT-2001	★ PKM28SEP-2001	★ PKD34EP-01R
Sound Pressure Level	70dB@2KHz@10cm@3Vp-p	75dB@10cm@12V	65dB@45.7cm@5Vrms	102±3.5dB (2.5cc coupler)
Oscillating Frequency	2.0KHz	2.0 ± 0.3KHz	2.0KHz	300Hz–3.4KHz
Current		20mA max.		
Operating Voltage	3 to 25Vp-p	3 to 20V	3 to 40Vrms	30 Volt RP
Operating Temp. Range	−20°C to +70°C	−20°C to +70°C	−30°C to +60°C	−20°C to +70°C
UL Rating	UL-94HB	UL-V1	UL-94V0	
DIMENSIONS: in. (mm)				

★ Available as standard through authorized Murata Electronics Distributors.

ULTRASONIC CERAMIC MICROPHONES MA40E1R/S

muRata

RATING
RECEIVER AND TRANSMITTER

Part Number	MA40A5R/S	MA40B5R/S	MA40E7R/S	MA40S2R/S	MA40S3R/S
Nominal Frequency (KHz)	40				
Sensitivity (dB)	−67 min.	−67 min.	−74 min.	−74 min.	−67 ± 6
Sound Pressure (dB)	112 min.	112 min.	106 min.	100 min.	111 ± 6
Directivity (deg)	50°	50°	100°	100°	100°
Capacitance (pF)	2000	2000	2200	1600	1600
Allowable Input Voltage (Vrms)	20	20	20	10	10
Operating Temperature Range (°C)	−20 to +85	−20 to +85	−30 to +85	−30 to +85	−30 to +85
Detectable Range (m)	0.2 to 6	0.2 to 6	0.2 to 3	0.2 to 4	0.2 to 4
Resolution (mm)	9				
Dimension (mm)	16ϕ x 12h		18ϕ x 12h	10ϕ x 6.8h	10ϕ x 7.1h
Weight (g)	2.8	2.3	4.5	0.7	0.6
Feature	General Use Broad-Band	Black Case	Waterproof	Miniature	Black Case
Figure	1	2	3	4	5

Sensitivity: 0dB = 1V/μbar, Sound Pressured at 30cm, 0dB = 2 x $10^{-4}\mu$ bar
"Operating temperature range," above mentioned, is effective only for actual use. As for temperature characteristics of sound pressure level and sensitivity, and durability, please see specification sheet.

DIMENSIONS: in. (mm)
RECEIVER AND TRANSMITTER

MA40A5R/S

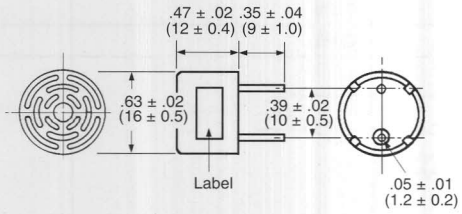


FIG. 1

MA40E7R/S

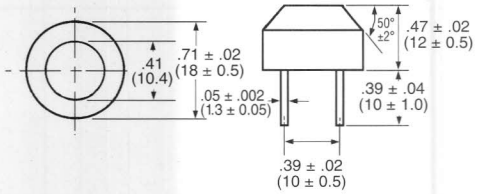


FIG. 3

MA40B5R/S

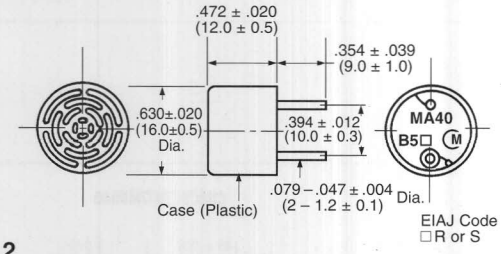


FIG. 2

MA40S2R/S

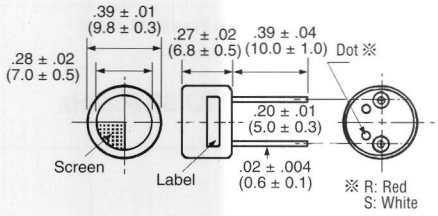


FIG. 4

MA40S3R/S

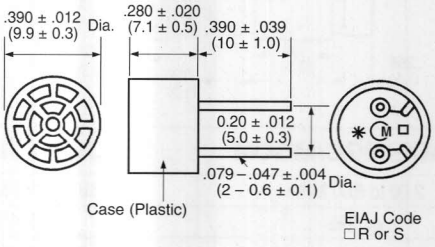
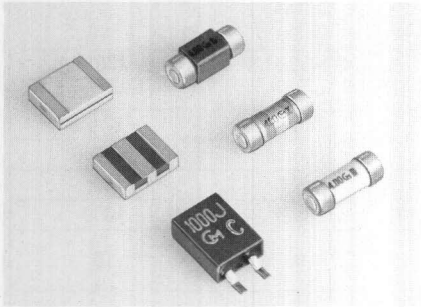


FIG. 5

CERAMIC RESONATORS FOR SURFACE MOUNT

CSBF, CSAC-MGC/MT/MX Series

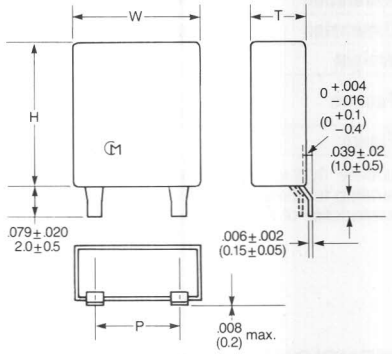


Increasing demand for size reduction and the economies realized through Surface Mount Technology, have led Murata Electronics to develop the new CSBF and CSAC ceramic resonators. The CSBF is a miniaturized leaded unit offering size compatibility with most commonly available surface mount devices, while the CSAC is a true surface mountable component. Both devices, are available in tape and reel packaging compatible with most auto-placement equipment.

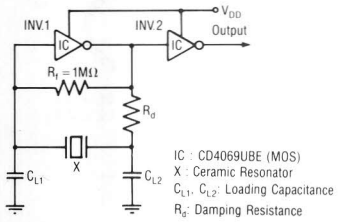
CSBF( )J SERIES – 430 TO 1250KHz

DIMENSIONS: in. (mm)

*Frequency (KHz)	W	H	T	P
430 to 440	.295 ± .012 (7.5 ± 0.3)	.335 ± .012 (8.5 ± 0.3)	.130 ± .012 (3.3 ± 0.3)	.197 ± .008 (5 ± 0.2)
450 to 460	.295 ± .012 (7.5 ± 0.3)	.335 ± .012 (8.5 ± 0.3)	.130 ± .012 (3.3 ± 0.3)	.197 ± .008 (5 ± 0.2)
470 to 480	.295 ± .012 (7.5 ± 0.3)	.335 ± .012 (8.5 ± 0.3)	.130 ± .012 (3.3 ± 0.3)	.197 ± .008 (5 ± 0.2)
490 to 500	.295 ± .012 (7.5 ± 0.3)	.335 ± .012 (8.5 ± 0.3)	.130 ± .012 (3.3 ± 0.3)	.197 ± .008 (5 ± 0.2)
700 to 850	.197 ± .012 (5 ± 0.3)	.256 ± .012 (6.5 ± 0.3)	.091 ± .008 (2.3 ± 0.2)	.197 ± .008 (5 ± 0.2)
910 to 1020	.197 ± .012 (5 ± 0.3)	.256 ± .012 (6.5 ± 0.3)	.091 ± .008 (2.3 ± 0.2)	.197 ± .008 (5 ± 0.2)
1200 to 1250	.197 ± .012 (5 ± 0.3)	.256 ± .012 (6.5 ± 0.3)	.091 ± .008 (2.3 ± 0.2)	.197 ± .008 (5 ± 0.2)

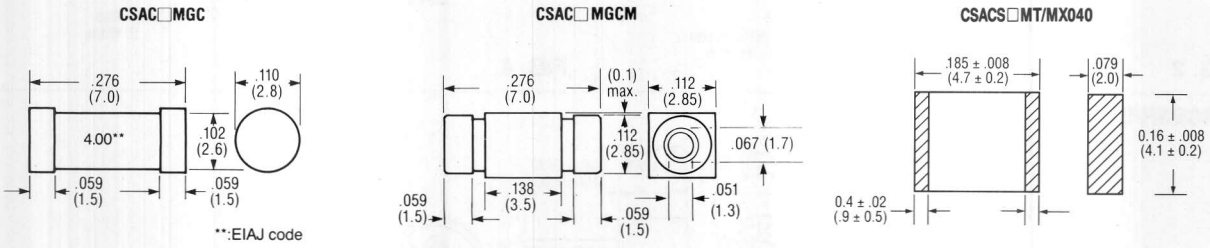


SPECIFICATIONS

Frequency Tolerance	±0.5%
Temperature Stability (−20°C to +80°C)	±0.3%
Aging (room temp., 10 years)	±0.3%
Standard Test Circuit	

***Note:** Only available in frequencies stated in the above chart.

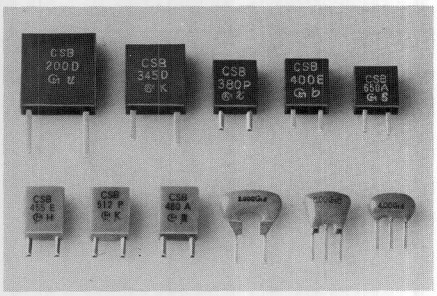
CSAC/CSACS SERIES — 2.00 TO 33.86MHz
DIMENSIONS: In. (mm)



SPECIFICATIONS	CSAC□MGC/MGCM	CSAC□MT	CSACS□MX040
Frequency Range	2.00 to 6.00 MHz	6.01 to 13.0 MHz	13.01 to 33.86 MHz
Frequency Tolerance	±0.5%	±0.5%	±0.5%
Storage Temperature Range	−40°C to +85°C		
Temperature Stability	±0.3% (−20°C to +80°C)	±0.5% (−20°C to +80°C)	±0.3% (−20°C to +80°C)
Withstand Voltage	50 VDC max.		

Note: Also available in automotive temp. grades.

PIEZOELECTRIC CERAMIC RESONATORS



Murata Electronics' ceramic resonators are widely used in clock oscillators for microprocessors, replacing quartz crystals at substantially reduced cost, and in many other applications. Features of ceramic resonators include low cost, good stabiltiy, small size and rugged construction, and a wide frequency range.

AVAILABLE AS STANDARD THROUGH AUTHORIZED MURATA ERIE DISTRIBUTORS

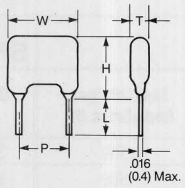
CSA 11.0 MTZ	CSB 480 J
CSA 2.00 MG	CSB 500 J
CSA 3.58 MG	CSB 640 J
CSA 4.00 MG	CSA 1.84 MG
CSA 6.00 MG	CSA 10.0 MTZ
CST 4.00 MGW	CSA 12.0 MTZ
CST 8.00 MTW	CSA 16.00 MXZ040
CST 12.0 MTW	CSA 4.19 MG
CSA 8.00 MTZ	CSA 8.00 MTZ
CSB 400 J	CSB 1000 J
CSB 455 J	CSB 800J

SPECIFICATIONS

TYPE	CSA TYPE	CSB TYPE	CST TYPE
Frequency Range	1.26 to 32 MHz	190 to 1250 KHz	1.80 to 25.99 MHz
Frequency Tolerance	±0.5%	±0.5%	±0.5%
Temperature Stability (−20°C to +80°C)	±0.5%	±0.3%	±0.3%
Time Stability (10 years)	±0.3%	±0.3%	±0.3%

CSA TYPE*

Dimensions: in. (mm)

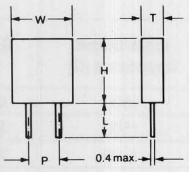


Dimensions mm	MK 1.26 to 1.799 MHz	MG 1.8 to 6.0 MHz	MTZ 6.01 to 13.0 MHz	MXZ 13.0 to 32.0 MHz
W	10.0	10.0 (12.0)**	10.0	10.0
H	10.0	7.5 (12.0)	10.0	10.0
T	5.0	5.0 (5.0)	5.0	5.0
P	5.0	5.0 (5.0)	(5.0)	5.0
L	5.0	5.0 (5.0)	5.0	5.0
Capacitance				
CL_1	30pF			
CL_2	30pF			

**Dimensions in parentheses ( ) for Freq. Range 2.0 to 2.75 MHz

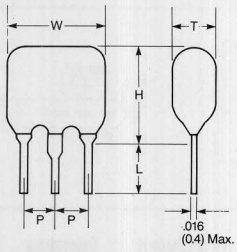
CSB TYPE*

D : Offset
J : In-Line



Dimensions mm	D 190 to 249 KHz	D 250 to 374 KHz	J 375 to 429 KHz	J 430 to 519 KHz	J 520 to 699 KHz	J 700 to 1250 KHz
W	13.5	10.8	8.0	7.5	7.5	5.0
H	14.5	12.2	9.0	8.5	7.2	6.0
T	3.8	3.8	3.3	3.3	2.8	2.2
P	10.1	7.7	5.0	5.0	5.0	2.5
L	9.0	6.7	3.5	3.5	3.5	3.5
Capacitance						
CL_1	330pF	220pF	120pF	100pF	100pF	100pF
CL_2	470pF	470pF	470pF	100pF	100pF	100pF

CST TYPE*



Dimensions mm	MG 1.80 to 2.44 MHz	MTW 6.0 to 13.0 MHz	MGW 2.45 to 6.0 MHz	MXW 13.00 to 25.99 MHz
W	10.0	10.0	10.0	10.0
H	10.0	10.0	5.0	8.0
T	5.0	5.0	5.0	5.0
P	2.5	2.5	2.5	2.5
L	5.0	5.0	5.0	5.0

CL_1 and CL_2 (loading capacitors) built-in.

*For additional information, please refer to Catalog No. P-05-A

PART NUMBERING SYSTEM

CS A □□□□ MG

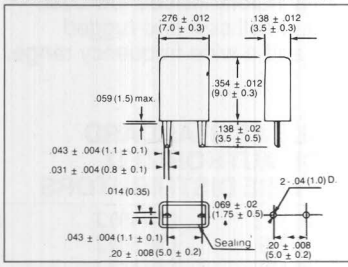
- MG — SUFFIX
- □□□□ — FREQUENCY (3 or 4 digits, floating decimal)
- A — FREQUENCY RANGE
  - A : 1.26 MHz to 32 MHz
  - T : 1.80 MHz to 25.99 MHz
- CS — CERAMIC RESONATOR

CS B 0 0 0 J

- J — PIN CONFIGURATION
  - D=Offset
  - J =In-Line
- 0 0 0 — FREQUENCY (No decimal)
- B — FREQUENCY RANGE (190 KHz to 1250 KHz)
- CS — CERAMIC RESONATOR

PIEZOELECTRIC CERAMIC FILTERS

EMITTER BYPASS FILTER

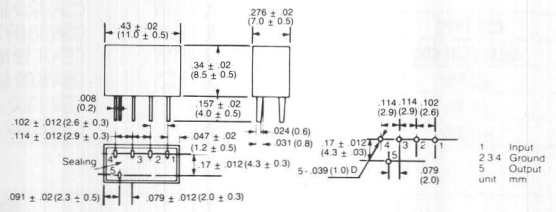


Model	Center Frequency (KHz)	3dB Bandwidth (KHz)	Ripple (dB) max.	Selectivity (dB) min.	Termination Impedance (ohms) max.
BFU455K	455±2	8 (±2KHz)	—	8 @ -9KHz 12 @ +9KHz	30 (15)

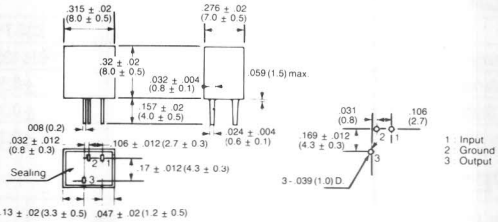
Dimensions: (mm)

CERAMIC FILTERS FOR DIGITAL COMMUNICATIONS

SFH



SFG



Dimensions: in. (mm)

SPECIFICATIONS

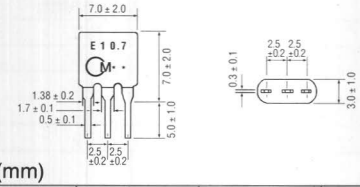
SFG 455 KHz

Part Number	Nominal Center Frequency (KHz)	6dB Bandwidth (KHz) min.	40dB Bandwidth (KHz) max.	Attenuation 455±100 KHz (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (Ω)	G.D.T. Tolerance Typ. (μsec.)*
★SFG455B	455±1.5	±15	±35	25 (455±80KHz)	5	1500	30 (±15KHz)
★SFG455C	455±1.5	±12.5	±30	25 (455±80KHz)	6	1500	30 (±12.5KHz)
★SFG455D	455±1.0	±10	±25	23	7	1500	30 (±10KHz)
★SFG455E	455±1.0	±7.5	±20	23	8	1500	30 (±7.5KHz)
★SFG455F	455±1.0	±6	±17.5	23	9	2000	20 (±6KHz)
★SFG455G	455±1.0	±4.5	±15	20	10	2000	20 (±4.5KHz)

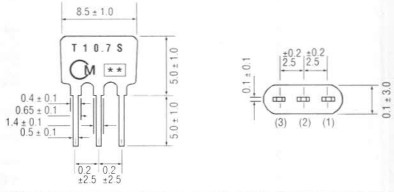
Part Number	Nominal Center Frequency (KHz)	6dB Bandwidth (KHz) min.	50dB Bandwidth (KHz) max.	Attenuation 455±100 KHz (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (Ω)	G.D.T. Tolerance Typ. (μsec.)*
★SFH455B	455±1.5	±15	±35	35	6	1500	40 (±15KHz)
★SFH455C	455±1.5	±12.5	±30	35	7	1500	40 (±12.5KHz)
★SFH455D	455±1.0	±10	±25	35	8	1500	40 (±10KHz)
★SFH455E	455±1.0	±7.5	±15	35	9	1500	40 (±7.5KHz)
★SFH455F	455±1.0	±6	±17.5	35	10	2000	40 (±6KHz)
★SFH455G	455±1.0	±4.5	±15	35	13	2000	40 (±4.5KHz)

CERAMIC FILTERS FOR FM RADIOS

SFE Series



SFT 10.7 Series



Dimensions: in. (mm)

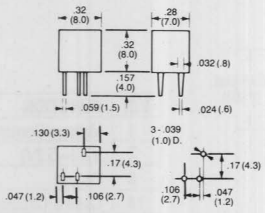
Model	Center Frequency (MHz, ±30KHz)	3dB Bandwidth (KHz) min.	20dB Bandwidth (KHz) max.	40dB Bandwidth (KHz) max.	Ripple (dB) max.	Spurious Response (9-12MHz) (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)	Operating Temperature Range	Withstanding Voltage
★SFE 10.7MA5-A	10.7MHz ±30KHz	280±50	650	—	1.0	30	6	330	−20°C to +80°C	50V DC
★SFE 10.7MS2-A		230±50	570	—	1.0	40	6			
★SFE 10.7MS3-A		180±40	520	—	1.0	40	7			
★SFE 10.7MJA10-A		150±40	380	—	1.0	38	10			
★SFT 10.7MS3-A		180±40	—	550	0.5	(9-12 MHz) 50	7.5			
★SFT 10.7MA5-A		280±50	—	700	0.5	(9-12 MHz) 50	6.0			

★Available as standard through authorized Murata Electronics Distributors.

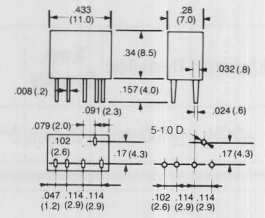
PIEZOELECTRIC CERAMIC FILTERS

MULTI-ELEMENT LADDER FILTERS FOR HIGH SELECTIVITY

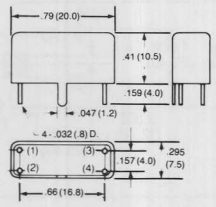
DIMENSIONS: in. (mm)



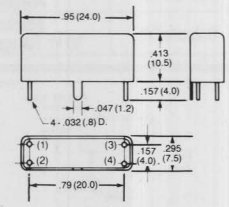
Model	Center Frequency (KHz)	6dB Bandwidth (KHz) min.	40dB Bandwidth (KHz) min.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
★CFU455B2	455±2	±15	±30	27	4	1500
★CFU455C2	455±2	±12.5	±24	27	4	1500
★CFU455D2	455±1.5	±10	±20	27	4	1500
★CFU455E2	455±1.5	±7.5	±15	27	6	1500
★CFU455F2	455±1.0	±6	±12.5	27	6	2000
★CFU455G2	455±1.0	±4.5	±10	25	6	2000
★CFU455H2	455±1.0	±3	±9	25	6	2000
★CFU455I2	455±1.0	±2	±7.5	25	6	2000



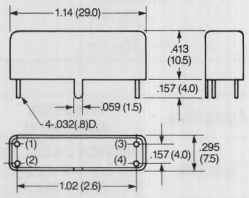
Model	Center Frequency (KHz)	6dB Bandwidth (KHz) min.	50dB Bandwidth (KHz) min.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
★CFW455B	455	±15	±30	35	4	1500
★CFW455C	455	±12.5	±24	35	4	1500
★CFW455D	455	±10	±20	35	4	1500
★CFW455E	455	±7.5	±15	35	6	1500
★CFW455F	455	±6	±12.5	35	6	2000
★CFW455G	455	±4.5	±10	35	6	2000
★CFW455H	455	±3	±9	35	6	2000
★CFW455I	455	±2	±7.5	35	7	2000



Model	Nom. Center Frequency (KHz)	6dB Bandwidth (KHz) min.	50dB Bandwidth (KHz) min.	Ripple (dB) max.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
★CFM455A	455	±17.5	±30	3dB within 3dB B.W. and 6dB within 6dB B.W.	50	3	1000
CFM455B	455	±15	±25		50	3	1000
CFM455C	455	±13	±23		50	3	1000
CFM455D	455	±10	±20		50	3	1500
CFM455E	455	±8	±16		45	5	1500
CFM455F	455	±6	±12		45	5	2000
CFM455G	455	±4	±10	*	45	5	2000
CFM455H	455	±3	±7.5	*	45	6	2000
CFM455I	455	±2	±5	*	45	7	2000



Model	Nom. Center Frequency (KHz)	6dB Bandwidth (KHz) min.	70dB Bandwidth (KHz) min.	Ripple (dB) max.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
CFR455A	455	±17.5	±30	3dB within 3dB B.W. and 6dB within 6dB B.W.	60	4	1000
CFR455B	455	±15	±25		60	4	1000
CFR455C	455	±13	±23		60	4	1000
CFR455D	455	±10	±20		60	4	1500
CFR455E	455	±8	±16		55	6	1500
CFR455F	455	±6	±12		55	6	2000
CFR455G	455	±4	±10	*	55	6	2000
CFR455H	455	±3	±7.5	*	55	7	2000
CFR455I	455	±2	±5	*	55	8	2000
CFR455J	455	±1.5	±4.5	*	55	8	2000



Model	Nom. Center Frequency (KHz)	6dB Bandwidth (KHz) min.	70dB Bandwidth (KHz) min.	Ripple (dB) max.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
CFS455A	455	±17.5	±30	3dB within 3dB B.W. and 6dB within 6dB B.W.	70	4	1500
CFS455B	455	±15	±25		70	4	1500
CFS455C	455	±13	±23		70	4	1500
CFS455D	455	±10	±20		70	4	1500
CFS455E	455	±8	±15		70	6	1500
CFS455F	455	±6	±12		70	6	2000
CFS455G	455	±4	±9	*	70	6	2000
CFS455H	455	±3	±7.5	*	70	7	2000
CFS455I	455	±2	±5	*	70	8	2000
CFS455J	455	±1.5	±4.5	*	60	8	2000

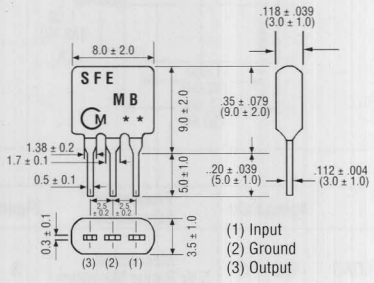
*3dB Ripple in 6dB B.W.

(Other bandwidths available.)

TV SOUND FILTERS

DIMENSIONS: in. (mm)

SFE

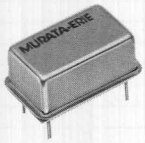


Model	Nominal Frequency (MHz)	3dB Bandwidth (KHz) min.	20dB Bandwidth (KHz) max.	Spurious Response (dB) min.	Insertion Loss (dB) max.	Input/Output Impedance (ohms)
★SFE 4.5 MBF	4.5	±60	530KHz	30dB min. (3.5-4.5MHz) 20dB min. (4.5-5.3MHz)	6	1000

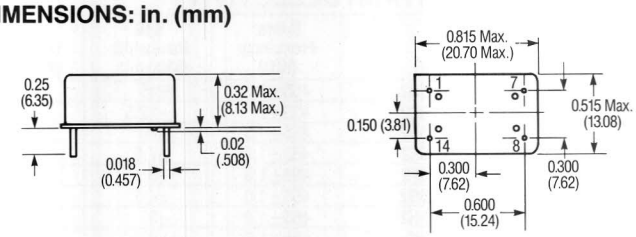
Model	Nominal Frequency (MHz)	30dB Bandwidth (KHz) max.	Min. Attenuation (dB min. at fo)			
★TPS 4.5 MB2	4.5	50 min.	35			

★Available as standard through authorized Murata Electronics Distributors.

VCXO, MINIATURE HYBRID



DIMENSIONS: in. (mm)



PIN	FUNCTION
1	Voltage Control Input
7	V_{ee} (−5.2V)
8	Output
14	Case & Circuit Ground

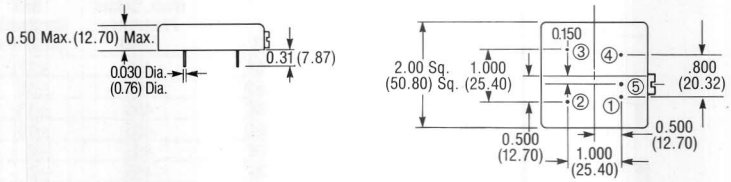
SPECIFICATIONS

Model	Features	Frequency Range	Input Voltage & Current	Output Type	Control Voltage and Freq. vs. Voltage Slope	AFC Input Impedance	Linearity	Deviation	Temp. Stability	Temp. Range
VH2340HE	High frequency fundamental crystal	15MHz to 60MHz	−5.2VDC @ 35mA Typ.	ECL "10KH"	0V to −5.0V Negative	10KΩ Min.	±20%	±100ppm	±25ppm	0°C to 70°C

TCXO, STANDARD

DIMENSIONS: in. (mm)

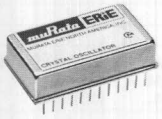
PIN	FUNCTION
1	Output
2	B+
3	Ground
4	N/C
5	Ground



SPECIFICATIONS

Model	Features	Frequency Range	Frequency Stability vs. Temperature Range	Input Voltage & Current	Output Type	Aging Rate	Frequency Adjustment
TC2140DT	High stability Very low aging	6MHz to 20MHz	±0.25ppm 0°C to +50°C	+12VDC @ 15mA max.	TTL Std.	0.2ppm/Yr.	Mechanical 10 Yr. Range Minimum

TCXO, MINIATURE



DIMENSIONS: in. (mm)

PIN	FUNCTION
1	Ground
2	RF Output
3	+VDC
7	Frequency Adj. V ref.
8	N/C
14	Frequency Adj. input

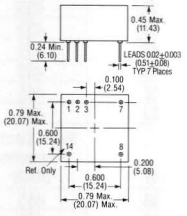


FIG.1

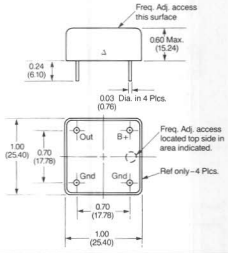


FIG.2

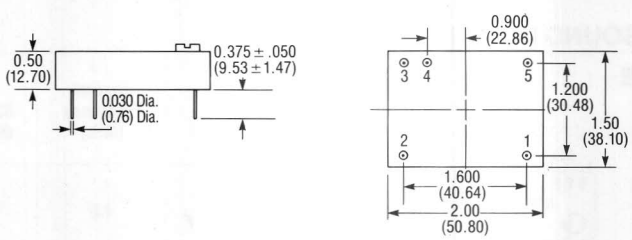
SPECIFICATIONS

Model	Features	Frequency Range	Frequency Stability vs. Temperature Range	Input Voltage & Current	Output Type	Aging Rate	Frequency Adjustment	Figure
TC2100CN	Requires only 0.35 cu. in. Direct replacement for K1516 Series	6MHz to 24MHz	±2ppm −40°C to +85°C	+10VDC @ 15mA max.	Sine, 1Vp-p, 1kΩ Load (Harmonics < −20dBc)	1ppm/Yr.	Electrical via Ext. Pot. or control voltage; 5 Yr. Range Minimum	1
TC2110AH	Low cost unit +5VDC operation	5MHz to 18MHz	±1ppm −20°C to +70°C	+5VDC @ 15mA max.	"HC" CMOS	1ppm/Yr.	Mechanical 10 Yr. Range Minimum	2

TCXO, HIGH FREQUENCY

DIMENSIONS: in. (mm)

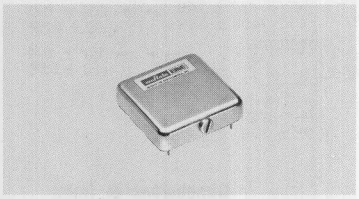
PIN	FUNCTION
1	B+
2	Ground
3	Output
4	Ground
5	Ground



SPECIFICATIONS

Model	Features	Frequency Range	Frequency Stability vs. Temperature Range	Input Voltage & Current	Output Type	Aging Rate	Frequency Adjustment	Figure
TC2170BJ	Small package; Internal freq. multiplier for better stability with fundamental crystal	24MHz to 120MHz	±1ppm −40°C to +70°C	+7.5VDC @ 40mA max.	Sine, +3dBm, 50Ω LOAD	1ppm/Yr.	Mechanical 5 Yr. Range Minimum	3
TC2180BJ	Very small package for UHF TCXO	120MHz to 500MHz	±5ppm −40°C to +70°C	+7.5VDC @ 45mA max.	Sine, +3dBm, 50Ω LOAD	2ppm/Yr.	Mechanical 5 Yr. Range Minimum	3

OCXO, HIGH STABILITY



DIMENSIONS: in. (mm)

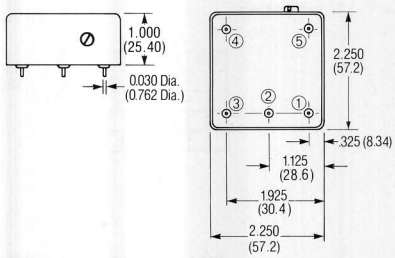


FIG. 1

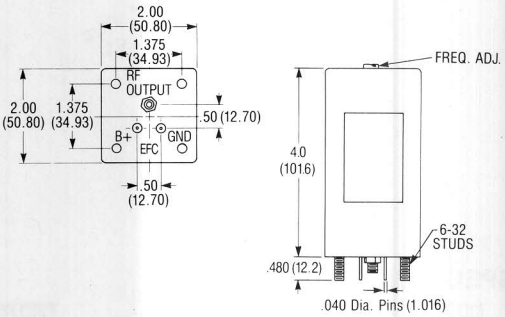


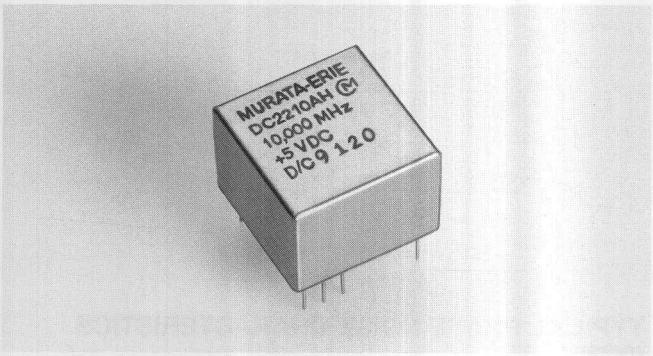
FIG. 2

PIN	FUNCTION
1	Tuning
2	N/C
3	Output
4	Case & Ckt. Gnd.
5	B+

SPECIFICATIONS

Model	Features	Frequency Range	Input Voltage & Power	Output Type	Electronic Freq. Control and Freq. vs. Voltage Slope	Temperature Stability	Aging	Package	Figure
OC2500ET	Low profile oven	1MHz to 20MHz	+15VDC 1.5W @ 25°C Typ. 4W max. @ turn-on	TTL	±2ppm min. for 0±5v Negative	$\pm1\times10^{-7}$ −20°C to +70°C	2×10^{-9}/Day	2.25×2.25×1.00	1
OC2520EK	"SC" or "IT" Cut Crystal For fast warm-up Low phase noise	5MHz to 15MHz	+15VDC 3.0W @ 25°C Typ. 15W max. @ turn-on	+7dBm into 50Ω	$\pm2\times10^{-7}$ min. for 0±5v Negative	$\pm5\times10^{-9}$ −40°C to +75°C	5×10^{-10}/Day	2.0×2.0×4.0	2
OC2530EJ	VHF frequency coverage	50MHz to 400MHz	+15VDC 3.0W @ 25°C Typ. 9W max. @ turn-on	+3dBm into 50Ω	±3ppm Mechanical	$\pm1\times10^{-7}$ −20°C to +70°C	1×10^{-8}/Day	2.0×2.0×4.0	2

DCXO, SINGLE CHIP



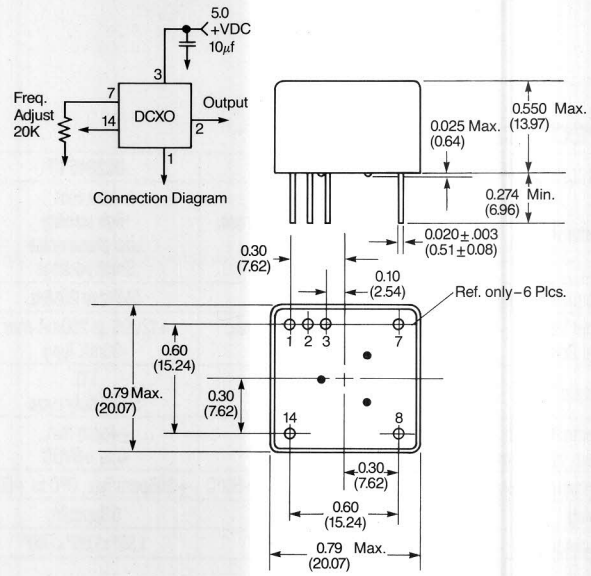
SPECIFICATIONS – MODEL DC221□□□

- Only one active device gives high reliability
- Low parts count for smallest size and best price
- Better stability than any other low cost TCXO

Frequency Range: 6MHz to 25MHz
Output: "H" ("HC" CMOS)
Spurious: −60dBc Typ.
Input Voltage: A Std. (+5VDC)
Input Current: 20mA Typ.
Frequency Adjustment:
To offset at least 10 Yrs. Aging

Frequency Stability: (△ f/f) vs.:
Temperature: See Table
Input Voltage: $\pm1\times10^{-8}$/%
Load Variation: $\pm1\times10^{-8}$/%
Time: 1ppm/Yr. Typ.
Time After Turn-On:
$\pm1\times10^{-7}$ within 5 sec.
Short Term (T=1 sec.): 1×10^{-9}

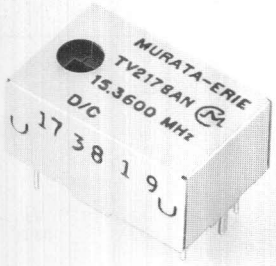
Model No.	Temp. Range	Max. Freq. Error
DC2210	−40°C to +85°C	$\pm1\times10^{-6}$
DC2211	−20°C to +75°C	$\pm5\times10^{-7}$
DC2212	0°C to +70°C	$\pm3\times10^{-7}$
DC2213	0°C to +50°C	$\pm2\times10^{-7}$

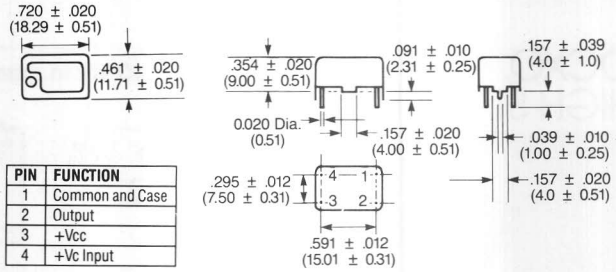


PIN	CONNECTIONS
1	GND.
2	R.F. Output
3	+5.0VDC
7	Freq. Adj. V Ref.
8	N/C
14	Freq. Adj. Input

Dimensions: in (mm)

TCVCXO LOW COST





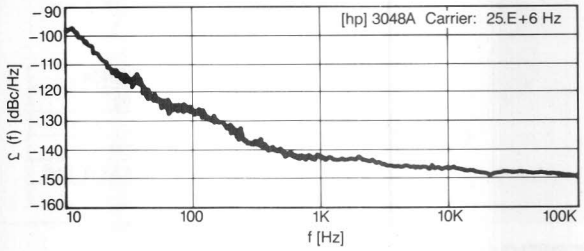
PIN	FUNCTION
1	Common and Case
2	Output
3	+Vcc
4	+Vc Input

Dimensions: in. (mm)

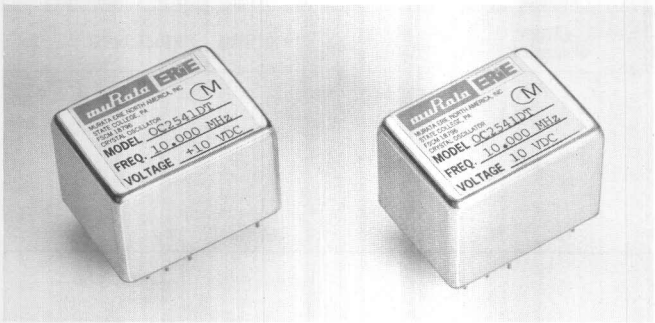
SPECIFICATIONS

MODEL		TV2178 AN
Features		Low Cost
Frequency Range		6.0MHz to 25.0MHz
Input Voltage and Current		+5.0VDC, ±5% @ 2mA Max.
Output Type		1Vp-p, Clipped Sine Wave
Load		1KΩ // 10pF
Frequency Adj.		Mechanical; 5 Yr. Range Min.
Electronic Freq. Control: Control Voltage and Deviation		2.5V ±2V, ±6ppm Min.
Frequency Stability	vs. Temperature	±1ppm, −40°C to +85°C
	vs. Supply Voltage	±0.08ppm (+5.0VDC, ±5%)
Aging		+1.0ppm/1 Yr., ±5ppm/10 Yr.
Package		0.461″ X 0.720″ X 0.354″H

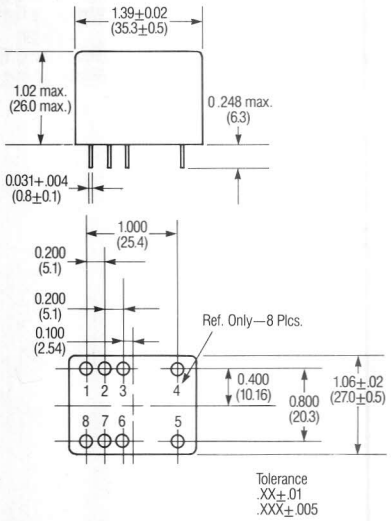
PHASE NOISE (TV2178 AN)



MINIATURE OCXO



OC2541, 2545

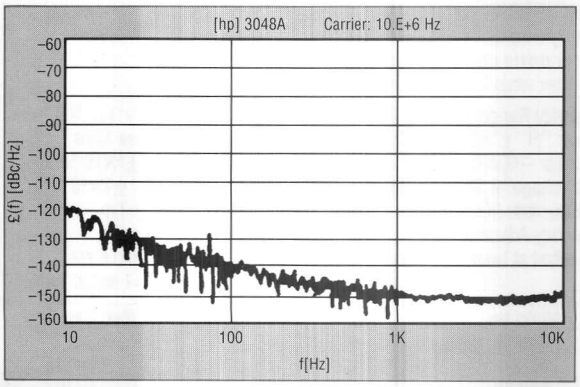


PIN	FUNCTION
1	Output
2	N/C
3	N/C
4	Ground
5	N/C
6	Control Voltage
7	N/C
8	+12V

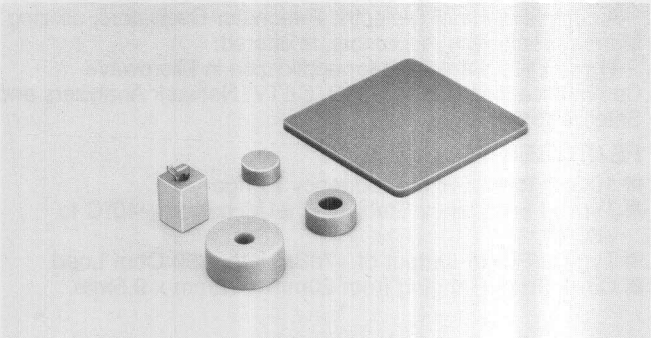
SPECIFICATIONS

MODEL	OC2541 DT	OC2545 DT
Features	Very low cost for High stability "SC" cut osc. Low phase noise Small package	Low cost High stability Low phase noise Small package
Frequency Range	5MHz to 20MHz	5MHz to 20MHz
Input Voltage and Power	+12VDC @ 250mA max. (90mA Typ.)	+12VDC @ 250mA max. (90mA Typ.)
Output Type	TTL 50/50 duty cycle	TTL 50/50 duty cycle
Electronic Freq. Control: Freq. vs. Voltage	±1ppm min., 0 to +10VDC	±4ppm min., 0 to +6VDC
Temperature Stability	±0.01ppm Typ., 0°C to +50°C	±0.05ppm Typ., 0°C to +50°C
Aging	0.15ppm/Yr.	0.3ppm/Yr.
Package	1.39″x1.06″x1.00″	1.39″x1.06″x1.00″

TYPICAL PHASE NOISE CHARACTERISTICS (0C2541DT)



DIELECTRIC RESONATORS (DR)-RESONATORS



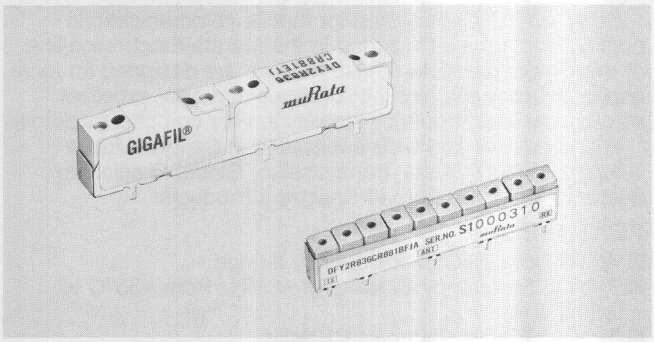
Murata Electronics offers a complete line of dielectrics with high permittivity that make excellent resonators for microwave oscillators and filters.

TE mode resonators are offered in both disc and coaxial cylinder configurations while TEM mode units are offered in 1/4 and 1/2 wavelength models. Substrates offer high Q's and dielectric constants making them ideal for applications in Microwave Integrated Circuits (MIC).

FEATURES

- 400MHz to 30GHz Frequency Range
- High Unloaded Q
- High Dielectric Constant
- Wide Temperature Coefficient Range: –4 to +10ppm/°C

DUPLEXERS

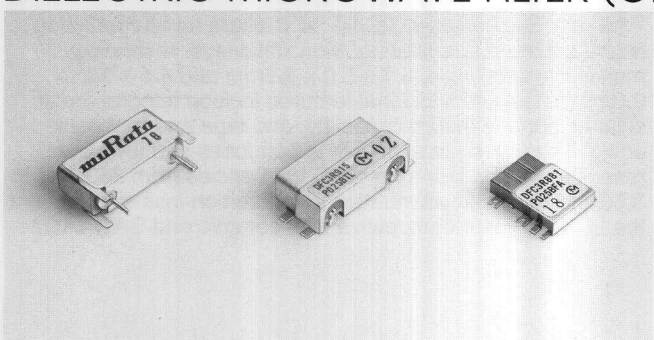


Murata Electronics offers a complete selection of dielectric resonator-based Duplexers. Three versions are included—single package, separated pair and separated.

FEATURES

- Low insertion loss through the use of high Q dielectric resonators.
- Small and light
- Excellent temperature stability through temperature compensated dielectric constant (0±5ppm/°C max.)
- Excellent mechanical stability
- High power ratings

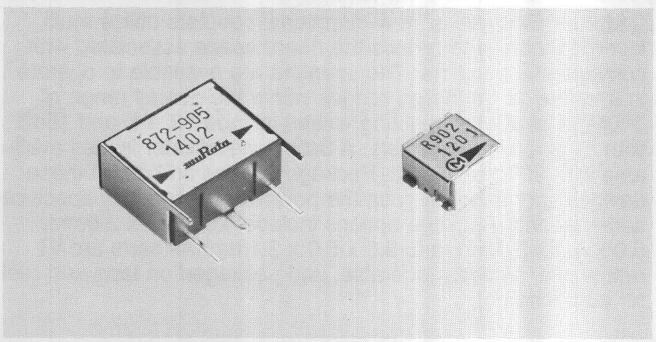
DIELECTRIC MICROWAVE FILTER (GIGAFIL®)



Murata Electronics offers a wide selection of dielectric resonator-based filters (Gigafils®) specifically designed for telecommunications applications.

These microwave filters are based on Dielectric Resonator technology and cover the frequency range from 400MHz to 3GHz. They offer extremely good temperature stability (±5ppm/°C), high selectivity and low insertion loss. Applications include CMT, GPS, Data Transmission, Navigation Systems, Cordless Telephones, Land Mobile Radio (LMR) and Spread Spectrum Systems.

ISOLATORS



Murata Electronics microwave isolators feature small size for surface mounting combined with excellent electrical performance. Typical isolation is 12dB with an insertion loss of 0.9dB. Power ratings 2.5 to 10W depending on model.

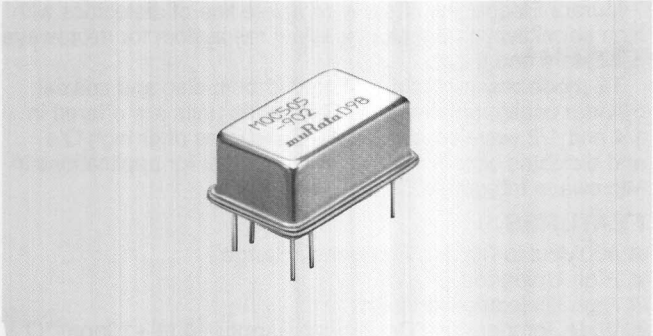
These ferrite devices are used as interstage matching devices to absorb antenna mismatching and maintain stable transmission.

Applications include Cellular Mobile Telephone (CMT), Microwave Test Equipment, etc.

FEATURES

- Power Ratings from 2 to 10 Watts
- 15dB min. Isolation
- Less than 1dB Insertion Loss
- Sizes Ranging From 6.9mm x 6.8mm x 4mm to 15mm x 15mm x 9mm
- Surface Mount Packages Available

DIELECTRIC RESONATORS OSCILLATORS (DRO)



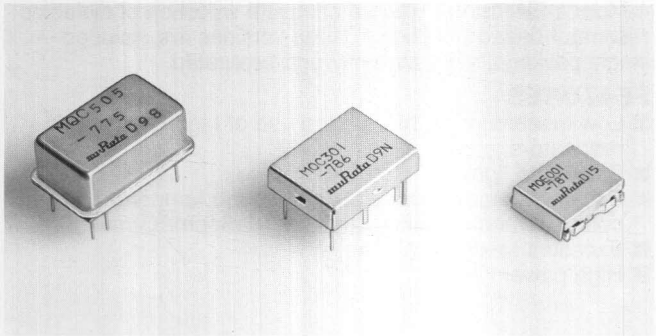
A complete line of Dielectric Resonator Oscillators, utilizing Murata Electronics resonators, is offered.

These DRO's are ideal for application in Microwave Communications, DBS, TVRO, CATV, Network Analyzers and Satellite Communications.

FEATURES

- 10GHz to 11.5GHz Frequency Range
- Typical Frequency Stability of ±1MHz from –40°C to +60°C
- Typical Power Output of +7dBm into a 50 Ohm Load
- Case Sizes Ranging from 20mm x 12mm x 9.5mm

VOLTAGE CONTROLLED OSCILLATORS (VCO)



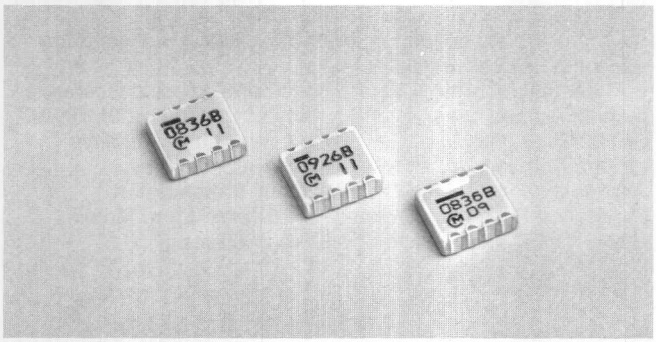
Compact VCO's designed for mobile communications applications are also included in the Murata Electronics line of microwave products. These devices are designed for local oscillator use in the high MHz ranges and offer excellent mechanical and frequency stability in very compact packages.

These devices find wide application in Cellular Mobile Telephone (CMT), Data Transmission, Global Positioning System (GPS) and Spread Spectrum Products.

FEATURES

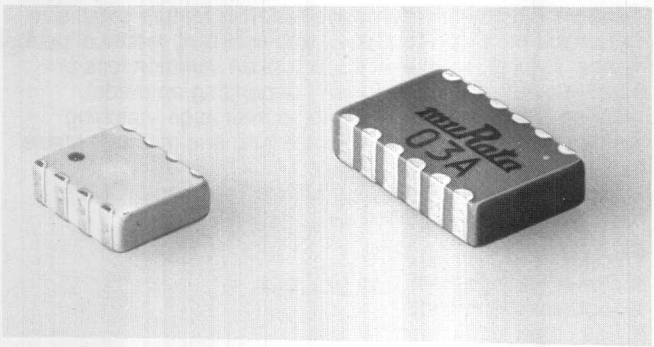
- 400MHz to 2.5GHz Frequency Range
- Typical Frequency Stability of ±2MHz from –35°C to +80°C
- Typical Tuning Range of ±12MHz

MONOLITHIC CHIP LC FILTER



Murata Electronics' LC Chip Filter offers an alternative to discrete component filtering. Monolithic layer technology makes the small size, 5.7 x 5.0 x 2.2mm and 4.5 x 3.2 x 2.0mm, possible. Additional features include integral metal shields, surface mount capability, and tape and reel packaging. The filters are available in bandpass and lowpass responses and cover a range of frequencies from 250MHz to 3.0GHz. Improved attenuation and insertion loss specs make the LC Chip Filter competitive with ceramic and SAW filters.

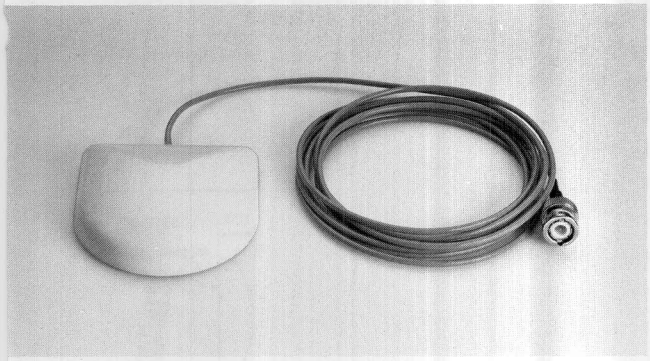
MONOLITHIC DIRECTIONAL COUPLER/POWER DIVIDER



Murata Electronics' new directional couplers utilize multi layer technology to reduce the board space associated with conventional couplers. The couplers are available to operate in a variety of frequency ranges within the overall range of 800MHz to 3GHz. Coupling values include 10, 14, and 18dB with other options possible. A 3dB power divider is also available with 90° phase shift. Package options on both of these devices vary depending on the power and frequency specifications needed. Package options include 4.5 x 3.2 x 2.0mm, 5.0 x 4.0 x 2.0mm, and 8.0 x 5.0 x 2.1mm. All parts are IR reflowable, suface mountable, and packaged on tape and reel for auto insertion.

muRata

ANT Series



FEATURES

- Utilizes high dielectric constant (ε_r = approx. 21.4) and high Q magnesium titanate ceramic
- Integral GaAs FET LNA
- Excellent temperature performance
- Small size and low profile
- Wide directivity
- Low cost

ELECTRICAL SPECIFICATIONS* – ANTENNA

Model	ANT0008/ANT00033	ANT0017	ANT0037
Center frequency	1575.42MHz	1580MHz	1575.42MHz
Polarization	R.H.C.P.	R.H.C.P.	R.H.C.P.
Absolute gain	0dBi min. above 20° –5dBi min. for 5° to 20°	0dBi min. above 20° elevation –5dBi min. above 5° elevation	0dBi min. above 20° elevation –5dBi min. above 5° elevation
Axial ratio	3dB max. for 90°	3dB max. at 90° elevation	3dB max. at 90° elevation
VSWR	1.5:1 max.	2:1 max.	1.5:1
Impedance	50Ω	50Ω	50Ω
Bandwidth	2MHz min. (VSWR≤1.5:1)	2MHz min. (VSWR≤2:1)	2MHz min. (VSWR≤1.5:1)

ELECTRICAL SPECIFICATIONS* – LNA

Model	ANT0008/ANT0033	ANT0017	ANT0037
Center frequency	1575.42MHz	1575.42MHz	1575.42MHz
Power gain (P.G.)	20dB min.	20dB min. (except cable loss)	28 ± 3dB
Noise figure	1.5dB max.	1.5dB max. (except cable loss)	2.5dB max.
VSWR	2:1 max.	2:1 max.	2:1 max.
Impedance	50Ω	50Ω	50Ω
Passband width	20MHz min. (P.G. 3dB down)	20MHz min. (N.F.≤1.5dB)	80MHz max. (P.G. 3dB down)
Supply voltage	5 ± 0.5V	5 ± 0.5V	5 ± 0.5V
Current consumption	20mA max.	20mA max.	30mA max.

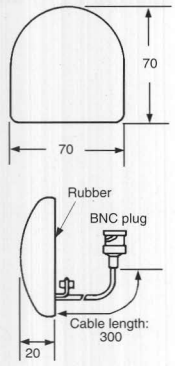
*At 20°C

SPECIFICATIONS – COMPLETE ASSEMBLY

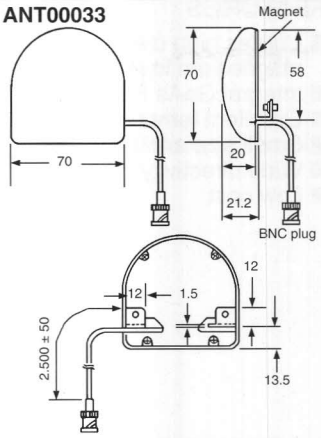
Overall Dimensions	ANT0008 : 70mm x 70mm x 20mm ANT0033 : 70mm x 70mm x 20.5mm ANT0037 : 70mm x 70mm x 20.5mm	42mm D x 13mm H
Operating Temperature Range	–30°C to +85°C	
Storage Temperature Range	–40°C to +100°C	

**Installed at the center of 90cm x 90cm ground plane

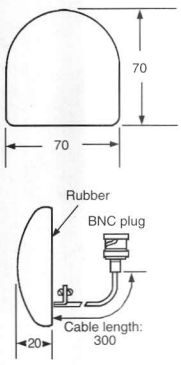
ANT0008



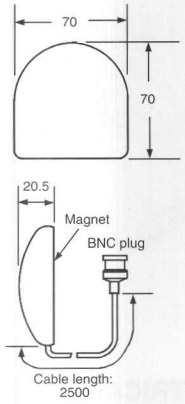
ANT00033



ANT0037

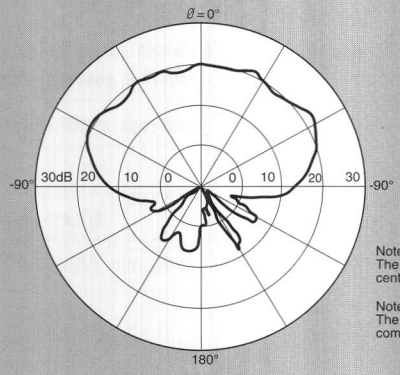


ANT0017



TYPICAL PERFORMANCE

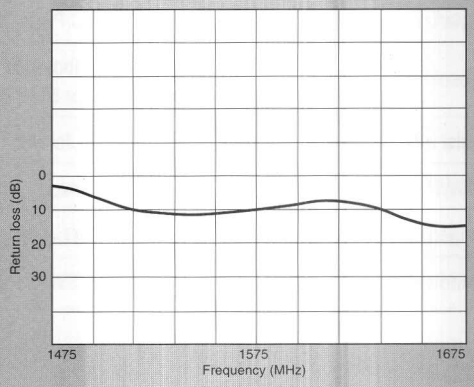
ANT0008
Radiation Pattern (with LNA)



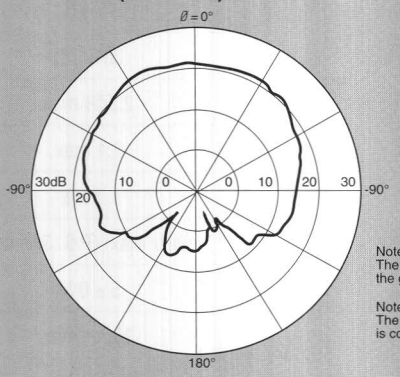
Note 1:
The GPS antenna is installed on the center of 90cm x 90cm ground plane.

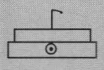
Note 2:
The GPS antenna gain with a LNA is comparison value with dipole antenna.

Return Loss



ANT0017
Radiation Pattern (with LNA)

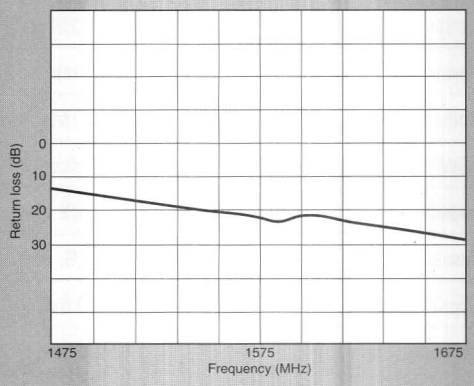




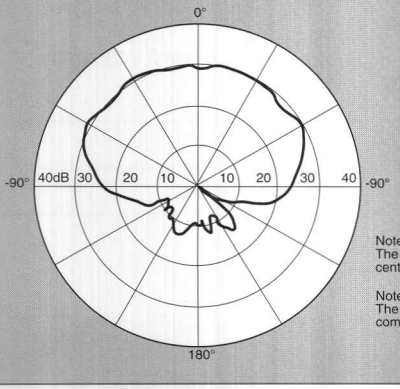
Note 1:
The GPS antenna is not installed around the ground plane.

Note 2:
The gain of GPS antenna unit with a LNA is comparison value with dipole antenna.

Return Loss



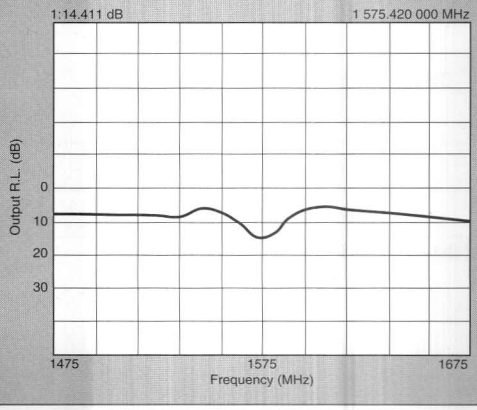
ANT0037
Radiation Pattern (with LNA)



Note 1:
The GPS antenna is installed on the center of 90cm x 90cm ground plane.

Note 2:
The GPS antenna gain with a LNA is comparison value with dipole antenna.

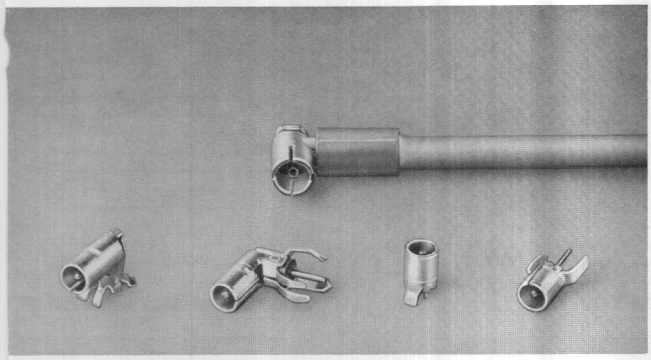
Return Loss



COAXIAL CONNECTORS
MICRO MINIATURE

muRata

BFA Series



FEATURES

- Micro miniature and low profile
- Low leakage
- High performance at high frequencies
- Low price
- Available cable assembly
- Available for ultra-thin coaxial cables

APPLICATIONS

Portable telephones, mobile telephones, cordless telephones, ocsilloscope, GPS, microwave equipment

PART NUMBERING

Part Number	Description
MM3325-2505	Straight jack connector for printed circuits (with male contact)
MM3325-2507	Straight jack connector with insulation spacer for printed circuits (with male contact)
MM3326-2506	Right angle jack connector for printed circuits (with male contact)
MM3327-2514	Straight plug receptacle for use on printed circuit boards—mates with MM3325-2505
MXYH□□□□□□□□	Right angle plug connector for flexible cables assembly (with female contact) See table on right.

ELECTRICAL SPECIFICATIONS

Item	Rating
Voltage	250V r.m.s.
Frequency	DC to 4GHz
	DC to 2GHz (MM3326-2506 and MM3327-2514 only)
Nominal Impedance	50Ω
Temperature Range	−40°C to +90°C
Insulation Resistance	1000MΩ
Contact Resistance	10mΩ
Withstanding Voltage	300VAC r.m.s.
V.S.W.R.	1.2 Maximum

MATERIALS AND FINISH

Part Name	Materials	Finish
Center Contact	Beryllium copper or Brass	Gold plated
Outer Contact	Phosper bronze	Silver plated or Nickel plated
Insulator	Poly-phenylene sulfide or Poly-butylen terephthalate	None
Outer Sleeve	Brass	Zinc plated

PART NUMBERING FOR CABLE ASSEMBLY

MX	YH	62	XX	200	0
❶	❷	❸	❹	❺	❻

❶ Cable assembly

❷ ❹ Cable termination connector code

Number	Connector
YH	MM3621-5901
XX	No Connector

❸ Cable number

Number	Cable	Outer Diameter	Outer Conductor	Insulation Mtl.
62	0.8D-QEW	2.5mm	Double Shield	Polyvinylchloride
63	0.8D-QEV	2.0mm	Single Shield	Polyvinylchloride
75	CO-6F-DSB-CX50	1.5mm	Double Shield	FEP High Temp. Res.

❺ ❻ Full length of cable assembly

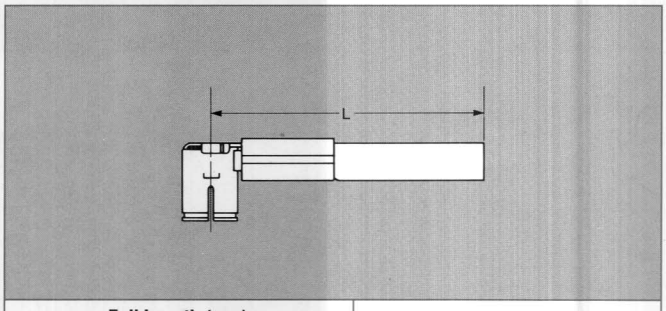
Length L (mm)= ❺ $\times 10^{❻}$

Ex. 100mm=$10^0 \times 100 \rightarrow 1000$

500mm=$500 \times 10^0 \rightarrow 5000$

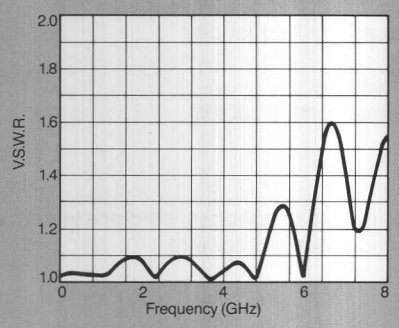
1000mm=$100 \times 10^1 \rightarrow 10001$

FULL LENGTH TOLERANCE



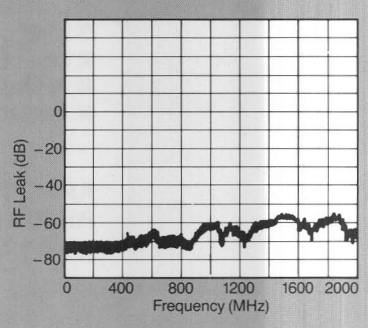
Full Length (mm)		Dimensional Tolerance (mm)
Over	Max.	
50	100	± 3
100	500	± 4
500	1000	±10
1000	—	$^{+2}_{0}$%

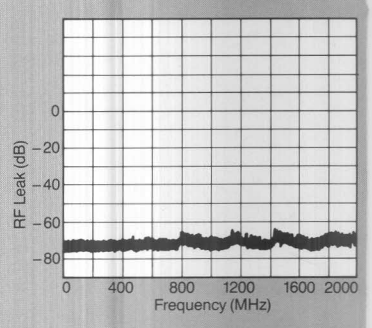
TYPICAL V.S.W.R.



MM3325-2505+MXYH□□□□□□□□□

TYPICAL RF LEAKAGE

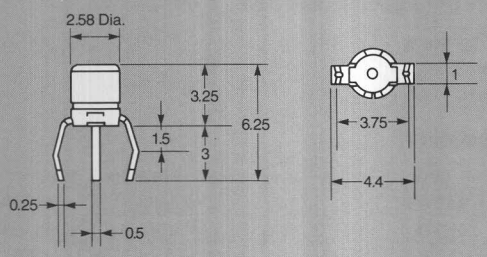




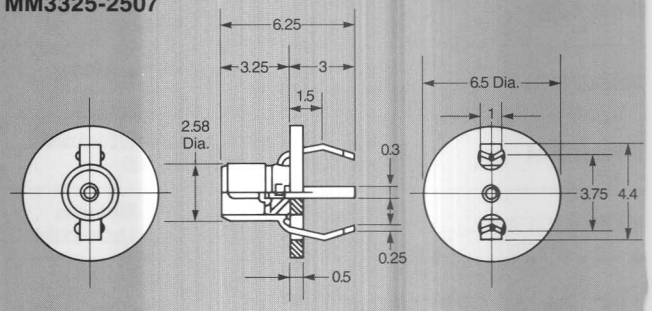
MM3325-2505+MXYH□□□□□□□□□

DIMENSIONS: mm

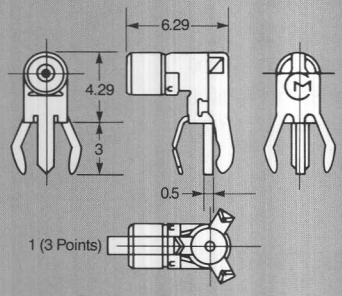
MM3325-2505



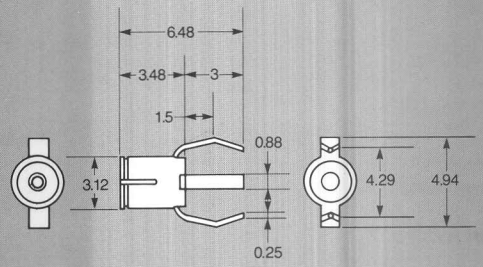
MM3325-2507



MM3326-2506

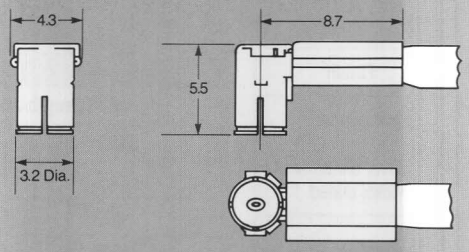


MM3327-2514



DIMENSIONS: mm

MXYH□□□□□□□□□

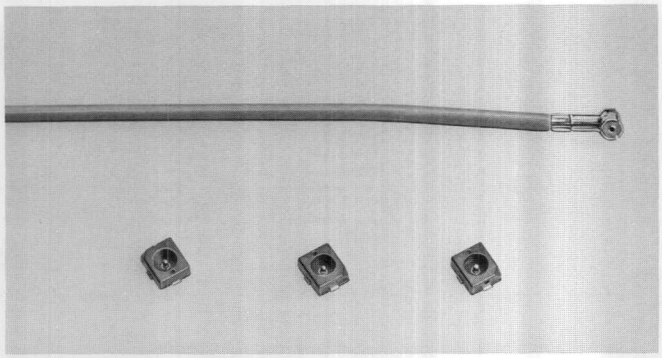


(This part number uses MM3621-5901 connector.)

COAXIAL CONNECTORS
SMT, MICRO MINIATURE

muRata

CCR Series



FEATURES

- Micro miniature, low profile (4.2mm max.)
- For SMT and reflow soldering
- Tape and reel available
- High performance (V.S.W.R. 1.2 max. at 2GHz)
- Available for ultra-thin coaxial cables

APPLICATIONS

Portable telephones, mobile telephones, cordless telephones, GPs, other microwave equipment

PART NUMBERING

Part Number	Description	Packaging	Quantity
MM4329-2700	Straight receptacle for printed circuit board. (Center contact shape : Pin)	Bulk package	Free
MM4329-2700TB1		178mm reel	500pcs/reel
MM4329-2700TB2		330mm reel	3000pcs/reel
MXSG63□□□□□□	Right angle cable assembly with flexible cable. (Center contact shape : Socket	—	

ELECTRICAL SPECIFICATIONS

Item	Rating
Voltage	250V r.m.s.
Frequency Rating	DC to 2GHz
Nominal Impedance	50Ω
Temperature Range	−40°C to +90°C
Insulation Resistance	500MΩ Minimum
Contact Resistance	15mΩ Maximum
Withstanding Voltage	300VAC r.m.s.
V.S.W.R.	1.2 Maximum

MATERIALS AND FINISH
MM4329-2700

Part Name	Materials	Finish
Center Contact	Stainless Steel	Gold plated
Outer Contact	Stainless Steel	Gold plated
Insulator	Poly-phenylene Sulfide	None

MXSG63□□□□□□

Part Name	Materials	Finish
Center Contact	Beryllium Copper	Gold plated
Outer Contact	Phospher Bronze	Gold plated and Nickel plated
Insulator	Fiber Reinforced Polypropylene	None

PART NUMBERING FOR CABLE ASSEMBLY

MX	SG	62	XX	200	0
❶	❷	❸	❹	❺	❻

❶ Cable assembly

❷ ❹ Connector code

Number	Connector
SG	CCR type Plug connector
XX	No Connector

❸ Cable number

Number	Cable	Outer Diameter	Outer Conductor Construction	Minimum Bending Radius
63	0.8D-QEV	2.0mm	Single Shield	Polyvinylchloride
75	CO-6F-DSB-CX50	1.5mm	Double Shield	FEP High Temp. Res.

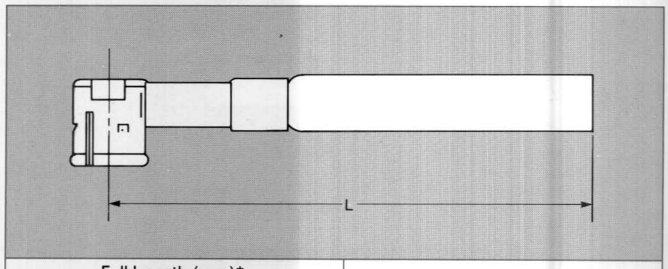
❺ ❻ Full length of cable assembly

Length L (mm)= ❺ $\times 10^{❻}$

Ex. 500mm=500×10^0 → 5000

1000mm=100×10^1 → 10001

FULL LENGTH TOLERANCE

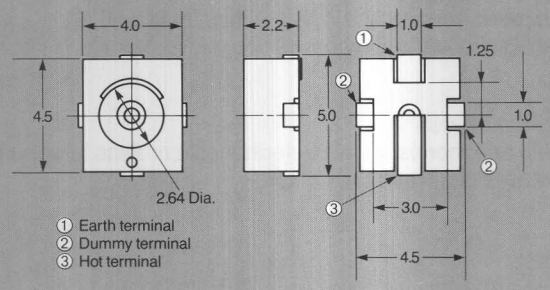


Full Length (mm)*		Dimensional Tolerance (mm)
Over	Max.	
50	100	± 3
100	500	± 4
500	1000	±10
1000	—	Total Length $^{+2}_{0}$%

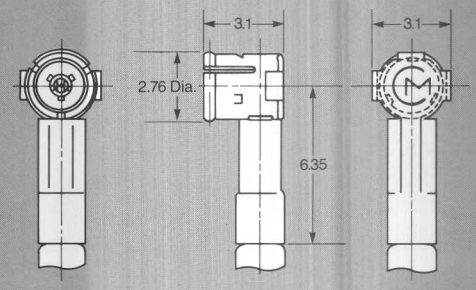
*L=50mm Min.

DIMENSIONS: mm

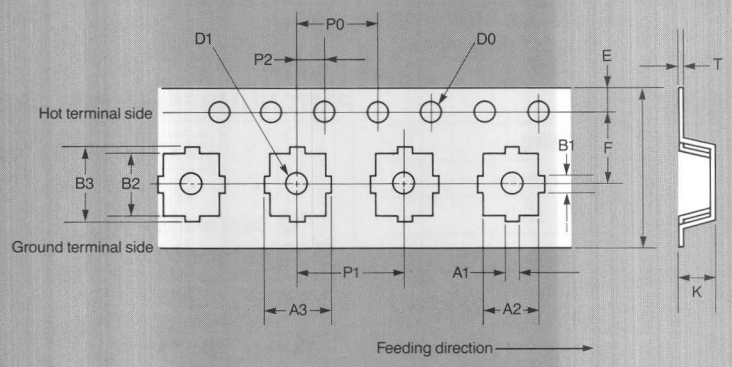
MM4329-2700



MXSG63 □□□□□□



TAPE DIMENSIONS: mm



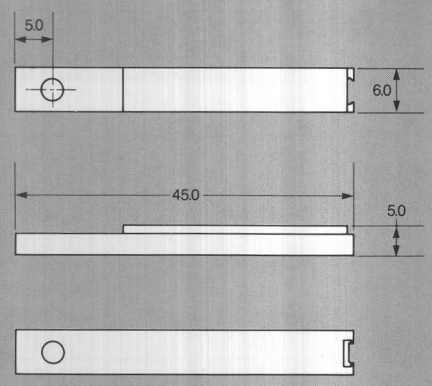
A1	A2	A3	B1	B2	B3	W	D0	D1
1.4	4.2	5.2	1.4	4.7	5.7	12±0.2	$\phi 1.5^{+0.1}_{0}$	1.5MIN.

E	F	K	P0	P1	P2	T
1.75±0.1	5.5±0.1	2.6±0.1	4±0.1	8±0.1	2±0.1	0.3

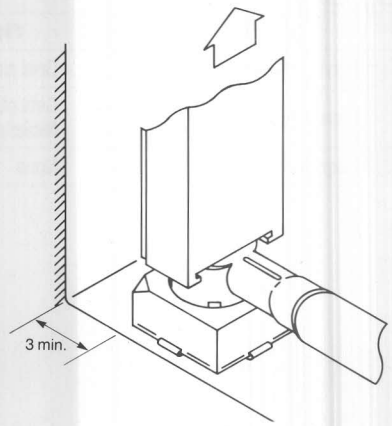
A1, A2, A3, B1, B2 AND B3 are the bottom dimensions of the cavity.

DISENGAGEMENT TOOL

M17000



DISENGAGEMENT TOOL APPLICATION



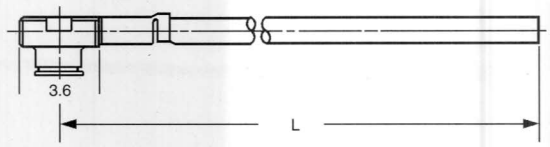
MATERIALS AND FINISH
MM6329-2700–RECEPTACLE

Part Name	Materials	Finish
Center Contact	Stainless Steel	Gold plated
Outer Contact	Brass	Gold plated
Insulator	Liquid Crystalline Polymer	None

MXRG□□□□□□□□–CONNECTOR

Part Name	Materials	Finish
Center Contact	Phosphor Bronze	Gold plated
Outer Contact	Brass	Gold plated
Insulator	Fiber Reinforced Polypropylene	None

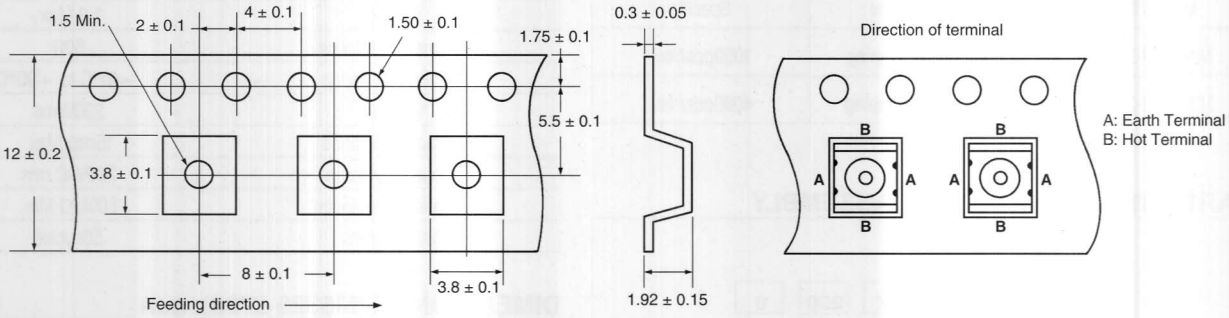
CABLE LENGTH TOLERANCE



Cable length L(mm)*		Dimensional tolerance(mm)
From	To	
50	100	± 3
100	500	± 4
500	1000	± 10
1000	—	+2% of L −0% of L

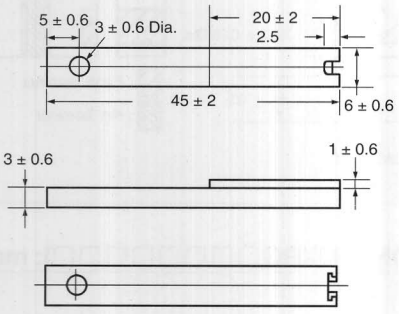
*L must be 50mm Min.

DIMENSIONS OF PLASTIC TAPE: mm

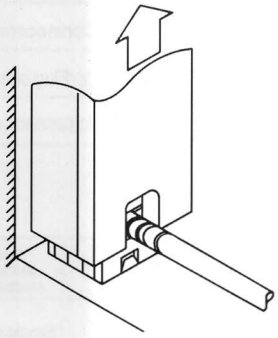


DISENGAGEMENT TOOL (Fig. 4): mm

M18000



How to use disengagement tool



PART NUMBERING – RECEPTACLE

PART NUMBER	PACKAGING	QUANTITY
MM6329-2700	Bulk package	Specify
MM6329-2700TB1	178mm Dia. Taping	1000pcs/reel
MM6329-2700TB2	330mm Dia. Taping	4000pcs/reel

PART NUMBERING – CABLE ASSEMBLY

MX	RG	76	XX	200	0
❶	❷	❸	❹	❺	❻

❶ Cable assembly
❷❹ Connector code for each end of cable

Code	Connector
RG	ESC type Plug connector
XX	No connector

❸ Cable code

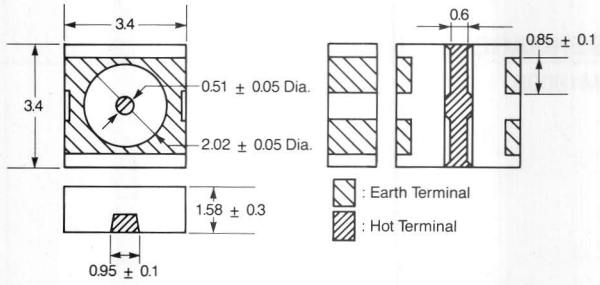
Code	Cable	Outer Diameter	Outer conductor construction	Minimum Bending radius
76	0.8D	1.25mm	Single shield	6mm
79	0.8D	1.25mm	Single shield	6mm

❺❻ Full length of cable assembly
Length L(mm) = ❺ $\times 10^{❻}$
Ex. 500mm = 500×10^0 = 5000
1000mm = 100×10^1 =1001
❺❻

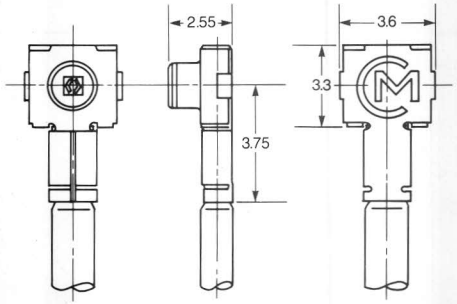
SPECIFICATIONS

Item	Rating and Characteristics
Frequency	From DC to 3GHz
VSWR	1.2 Max.
Nominal Impedance	50Ω
Temperature Range	–40°C to +90°C
Voltage	250Vrms
Contact Resistance	15mΩ Max.
Withstand Voltage	300VAC rms
Insulation Resistance	500MΩ Min.
Mating Cycles	50cycles

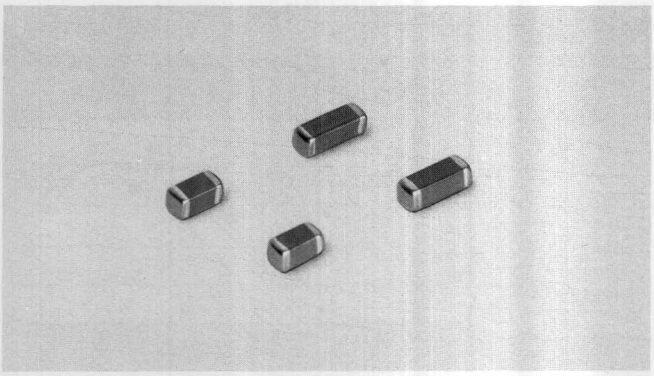
DIMENSIONS (MM6329-2700): mm



DIMENSIONS (MXRG□□□□□□□□): mm



BLM SMT Ferrite Beads



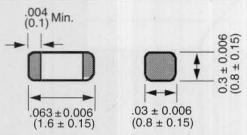
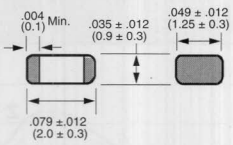
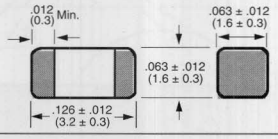
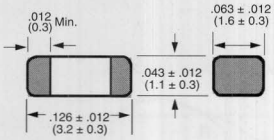
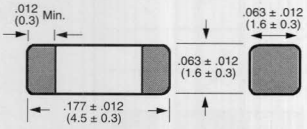
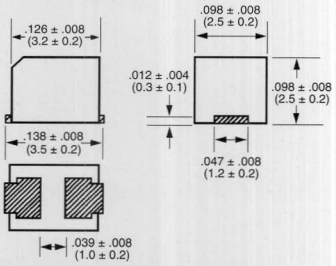
This new series of solid, ferrite chips for surface mount applications is designed to reduce the possibility of spurious oscillation in high frequency amplifying circuits and operate effectively from several MHz to several hundreds of MHz. Because of their small size, they are mountable on 2.5 mm c-c pitch thus saving considerable PCB space.

FEATURES

- Surface mountable on 2.5 mm pitch (BLM21 Series 2.0mm).
- No stray capacitance to 1 GHz.
- Wide temperature range: –55°C to +125°C (BLM550 –25°C to +85°C).
- Effective noise suppression to several hundreds of MHz.
- Prevents oscillation in HF amplifiers.
- Nickel barrier for solder heat resistance.
- Suitable for both flow and reflow soldering applications (BLM550 – Reflow only)

DIMENSIONS: in. (mm)

ELECTRICAL CHARACTERISTICS

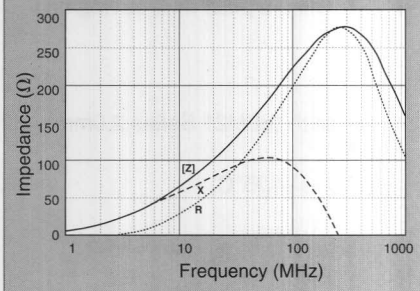
	Part Number★	Characteristics: Impedance (Ω) (Typ.) at 100MHz	Rated Current (mA)	DC Resistance (Ω max.)
0603 	★BLM11A12	220	200	0.5
0805 	★BLM21B03	5 (27 @ 1GHz)	500	0.2
	★BLM21A05	120	200	0.6
	★BLM21A11	300	200	1.0
	★BLM21A10	600	200	1.5
1206 	★BLM31A02	70	200	0.5
1206 	★BLM32A06	600	200	1.0
	★BLM32A07	600	200	1.0
1806 	★BLM41A01	80	500	0.3
	★BLM41A04	150	200	0.7
1210 	★BLM550RA01	2000	500	0.7

★All values are standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

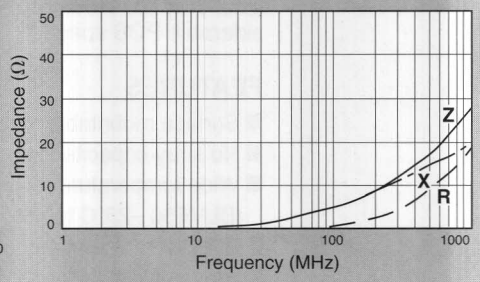
BLM11/21/31/32/41 — Suffix=PB=Bulk, Suffix=PT=Tape & Reel
BLM550 — Suffix=B1=Bulk, Suffix=T1=Tape & Reel

IMPEDANCE VS. FREQUENCY CHARACTERISTICS (TYP.)

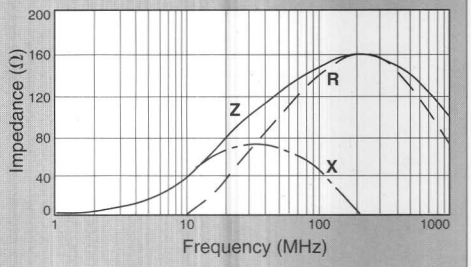
BLM11A12



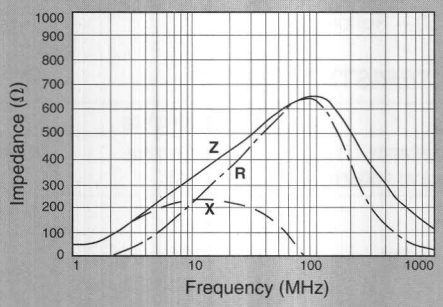
BLM21B03



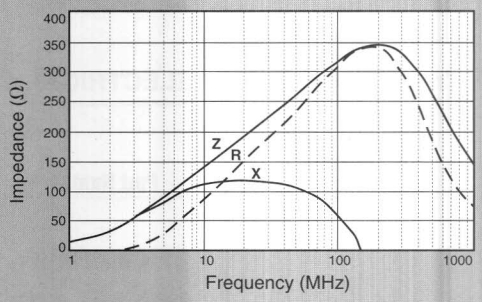
BLM21A05



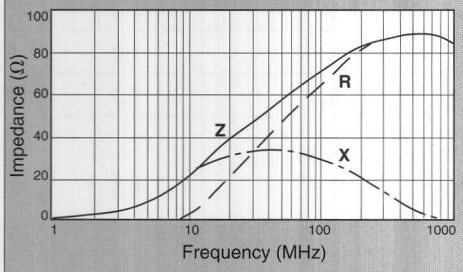
BLM21A10



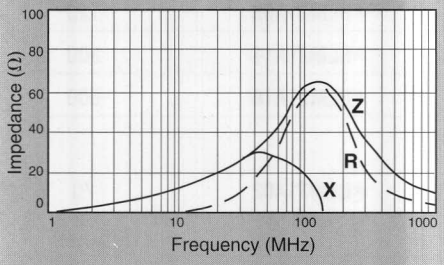
BLM21A11



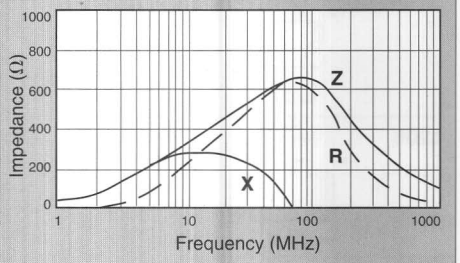
BLM31A02



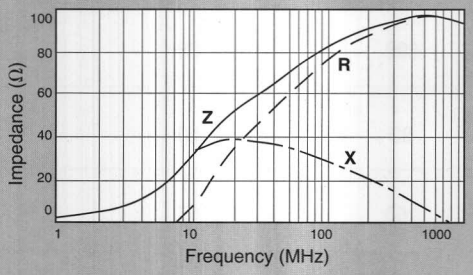
BLM32A06



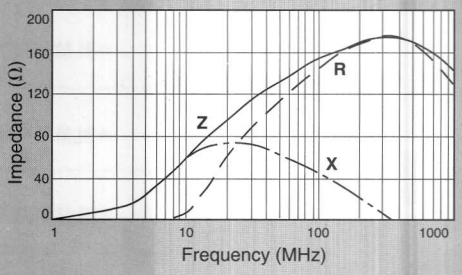
BLM32A07



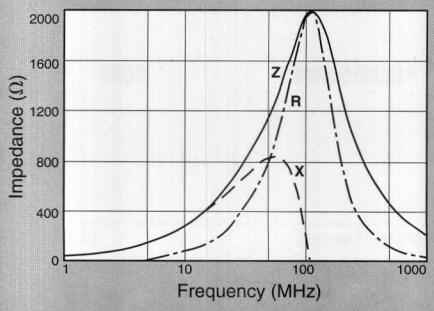
BLM41A01



BLM41A04

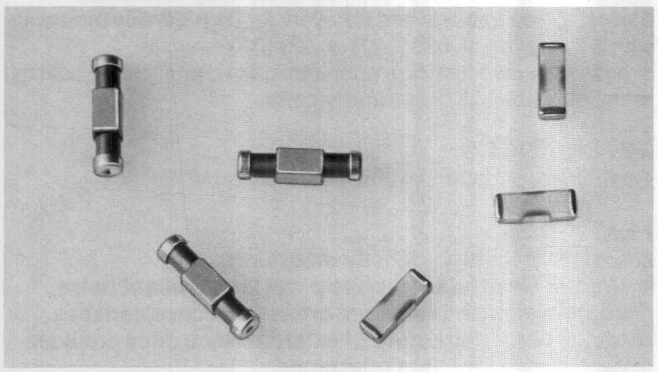


BLM550RA01



EMI SUPPRESSION FILTERS
SURFACE MOUNT

NFM Series

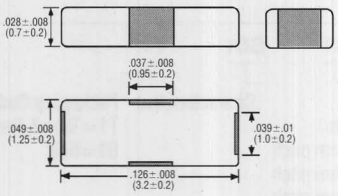
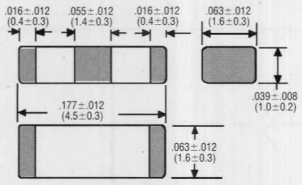
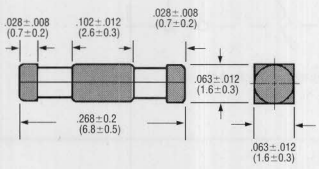


The new NFM Series of surface mount EMI filters are true feed-thru EMI/RFI filters; the NFM40/41 providing an SMT feed-thru capacitor in various values and the NFM61 providing series ferrite bead inductors, in addition to a capacitor, on both the input and output sides of the filters. Applications for these new filters include filtering of DC power lines and high speed circuits.

FEATURES

- Excellent insertion loss characteristics
- Wide frequency range of operation
- Tape and reeled for auto-placement
- High current capability (NFM61 Series)
- High solder heat resistance

SPECIFICATIONS

DIMENSIONS: in. (mm)	Part Number	Capacitance	Insulation Resistance	Rated Voltage	Rated Current	DC Resistance	Operating Temp. Range
	★NFM40R01C220	22pF + 50/ −20%	1000MΩ min.	25V DC	200mA	0.6Ω max.	−55°C to +125°C.
	★NFM40R01C470	47pF + 50/ −20%					
	★NFM40R01C101	100pF + 50/ −20%					
	★NFM40R11C221	220pF + 50/ −20%					
	★NFM40R11C471	470pF + 50/ −20%					
	★NFM40R11C102	1000pF + 50/ −20%					
	★NFM40R11C222	2200pF + 50/ −20%					
	★NFM40R11C223	22000pF + 80/ −20%					−55°C to +85°C
	★NFM41R01C220	22pF± 50/20 %	1000MΩ min.	100V DC	300mADC	0.3Ω max.	−55°C to +125°C.
	★NFM41R01C470	47pF± 50/20 %					
	★NFM41R01C101	100pF± 50/20 %					
	★NFM41R01C221	220pF± 50/20 %					
	★NFM41R01C471	470pF± 50/20 %					
	★NFM41R11C102	1000pF± 50/20 %					
	★NFM41R11C222	2200pF± 50/20 %					
	★NFM41R11C223	22000pF± 50/20 %					
	NFM41P11C204	200000pF± 80/20 %	1000MΩ min.	50V DC	2A DC	0.05Ω Max.	−55°C to +85°C
	★NFM61R00T330	33pF±30%	1000MΩ min.	50V DC	2A DC	0.05Ω max.	−25°C to +85°C
	★NFM61R00T680	68pF±30%					
	★NFM61R00T101	100pF±30%					
	★NFM61R00T181	180pF±30%					
	★NFM61R00T361	360pF±20%					
	★NFM61R00T681	680pF±30%					
	★NFM61R10T102	1000pF +80/−20 %					
	★NFM61R30T472	4700pF +80/−20 %					

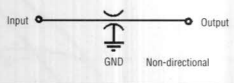
HIGH TEMPERATURE SERIES

Part Number	Capacitance	Insulation Resistance	Rated Voltage	Rated Current	DC Resistance	Operating Temp. Range
★NFM61RH00T330	33pF±30%	1000MΩ min.	100V DC	2A DC	0.05 Ω max.	−55°C to 125°C
★NFM61RH00T680	68pF±30%					
★NFM61RH00T101	100pF±30%					
★NFM61RH00T181	180pF±30%					
★NFM61RH00T361	360pF±20%					
★NFM61RH00T681	680pF±30%					
★NFM61RH10T102	1000pF± 80/20 %					
★NFM61RH20T332	3300pF± 80/20 %					

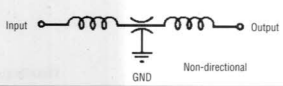
NFM61RH20T332 is specially adapted for reflow soldering. The flow soldering method should not be used.
Suffix=B1=Bulk Sufffix=T1=Tape & Reel

EQUIVALENT CIRCUITS

NFM41R / NFM40R

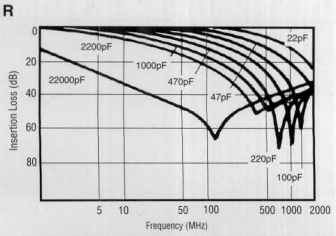


NFM61R/RH

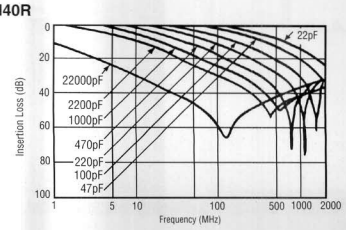


INSERTION LOSS/FREQUENCY CHARACTERISTICS (TYPICAL)

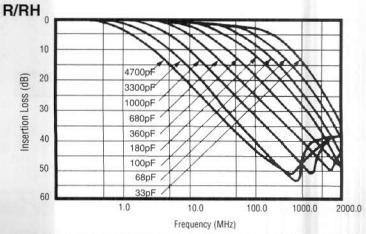
NFM41R



NFM40R



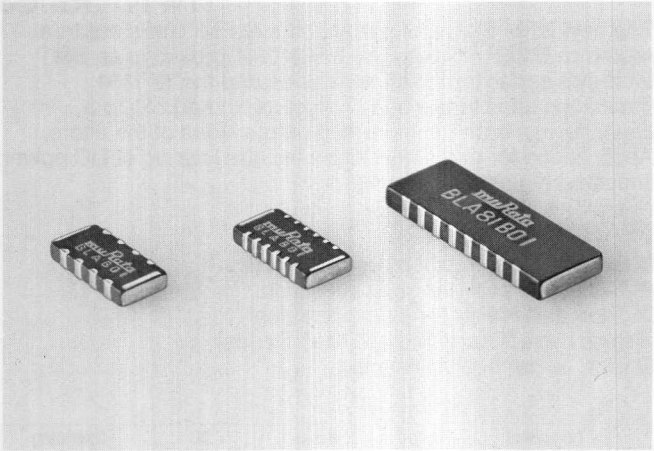
NFM61R/RH



★All values are standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel, denoted by T1 suffix.

EMI SUPPRESSION FILTERS
SURFACE MOUNT
CHIP FERRITE BEAD ARRAY

BLA81 Series



The BLA81 Series is a chip ferrite bead array for surface mounting applications and excellent for high-density mounting with a land pitch of .050 (1.27) or .031 (0.8).

It is well suited for noise suppression in digital circuit boards or the I/O cables of digital instruments.

APPLICATIONS

Computers, peripherals, digital TVs, digital VCRs, etc.

FEATURES

- **Excellent for high-density mounting.**
- **Unique electrode structure provides excellent noise suppression and excellent cross-talk characteristics.**
- **Nickel barrier structure of external electrodes provides excellent solder heat resistance.**
- **Operating Temperature Range: −55°C to +125°C.**

SPECIFICATIONS

Part Number	Impedance (Typ.) at 100MHz	Rated Current	Operating Temperature Range
★BLA81B01	70Ω	300 mA	−55 to +125°C
★BLA62B01		200 mA	
★BLA41B01		200 mA	

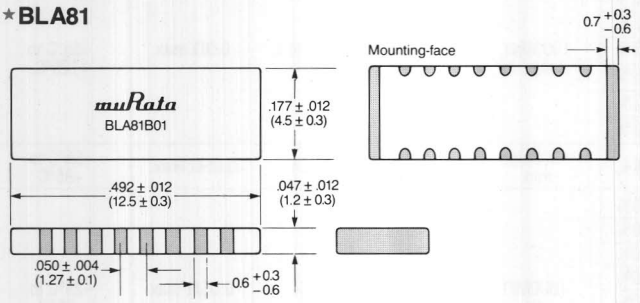
PART NUMBERING

BLA 81 B01 T1

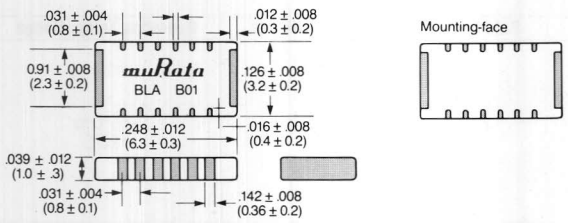
- **Chip**: Solid Inductor Array
- **Number of Circuit and Terminal Pitch**: 81: 8 circuit 1.27mm pitch; 62: 6 circuit 0.80mm pitch; 41: 4 circuit 1.27mm pitch
- **Characteristics**
- **Packaging Code**: T1 = Tape & Reel; B1 = Bulk

DIMENSIONS: in. (mm)

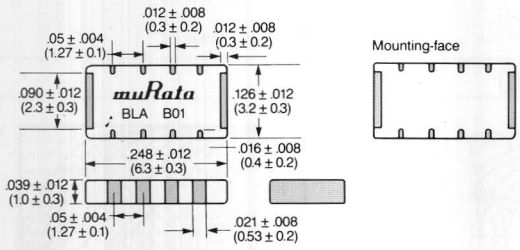
★BLA81



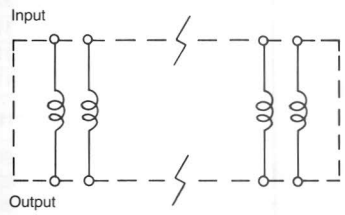
BLA62



BLA41

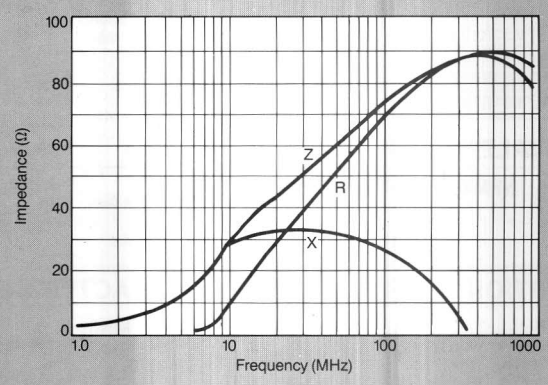


EQUIVALENT CIRCUIT



BLA81/62/41 Series is non-directional.

IMPEDANCE VS. FREQUENCY CHARACTERISTICS (TYP.)

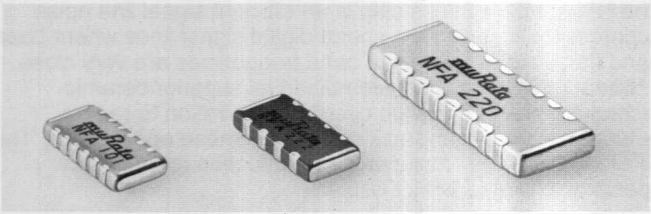


★All values are standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

EMI SUPPRESSION FILTERS SURFACE MOUNT FEED-THRU TYPE

muRata

NFA Series



The NFA Series is a chip feed-thru capacitor array filter for surface mounting aplication and is excellent for high density mounting with a land pitch of .050 (1.27) or .031 (0.8).

It has only two ground terminals for 4 through 8 circuits, therefore making it easy to design a ground pattern.

It is well suited for noise suppression in digital circuit boards or in I/O cables of digital instruments.

FEATURES

- Excellent for high density mounting.
- Unique electrode structure provides excellent noise suppression and excellent cross-talk characteristics.
- Just two ground terminals for all circuits.
- Simple land design makes possible effective EMI suppression with narrow land pitch.
- Nickel barrier structure of external electrodes provides excellent solder heat resistance.
- Wide variety of capacitance values offered.

PART NUMBERING

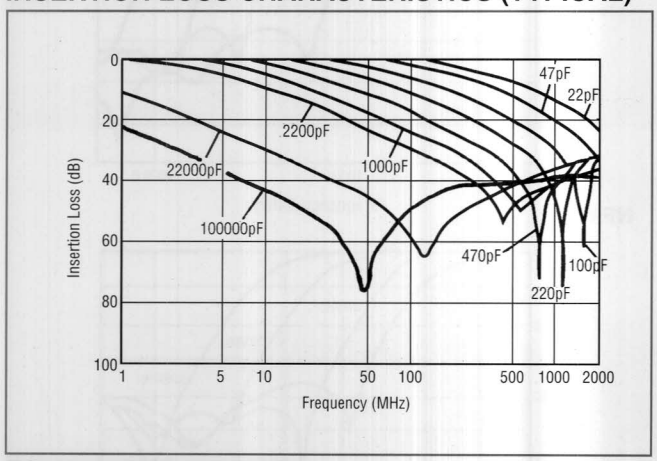
NFA 81 R 00 C 221 T1

- **Chip** — Solid Array
- **Number of Circuit and Terminal Pitch** — 81: 8 circuit, 1.27mm pitch; 62: 6 circuit, 0.08mm pitch; 41: 4 circuit, 1.27mm pitch
- **Type** — Monolithic
- **Class** — Number
- **Circuit Composition**
- **Capacitance**
- **Packaging Code** — T1=Tape&Reel; B1=Bulk

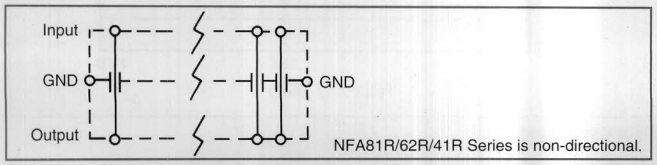
SPECIFICATIONS

Part Number	Capacitance +50, −20%	Rated Voltage	Rated Current	Insulation Resistance	Operating Temp. Range
★NFA81R00C220	22pF	50V DC	300mA DC	1000MΩ min.	−55 to +125°C
★NFA81R00C470	47				
★NFA81R00C101	100				
★NFA81R00C221	220				
★NFA81R00C471	470		200mA DC		
★NFA81R10C102	1000				
★NFA81R10C222	2200				
★NFA81R10C223	22000		300mA DC		
★NFA62R00C220	22pF	50V DC	200mA DC	1000MΩ min.	−55 to +85°C
★NFA62R00C470	47				
★NFA62R00C101	100				
★NFA62R00C221	220				
★NFA62R00C471	470				
★NFA62R00C102	1000				
★NFA62R10C222	2200				
★NFA62R10C223	22000				
★NFA41R00C220	22pF	50V DC	200mA DC	1000MΩ min.	−55 to +85°C
★NFA41R00C470	47				
★NFA41R00C101	100				
★NFA41R00C221	220				
★NFA41R00C471	470				
★NFA41R10C102	1000				
★NFA41R10C222	2200				
★NFA41R10C223	22000				
★NFA41R10C104	100000+80/−20%				

INSERTION LOSS CHARACTERISTICS (TYPICAL)

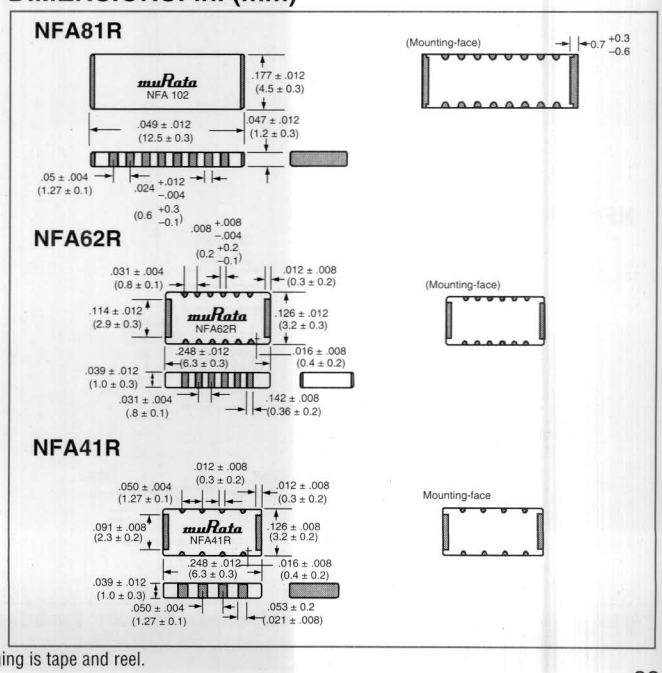


EQUIVALENT CIRCUIT



NFA81R/62R/41R Series is non-directional.

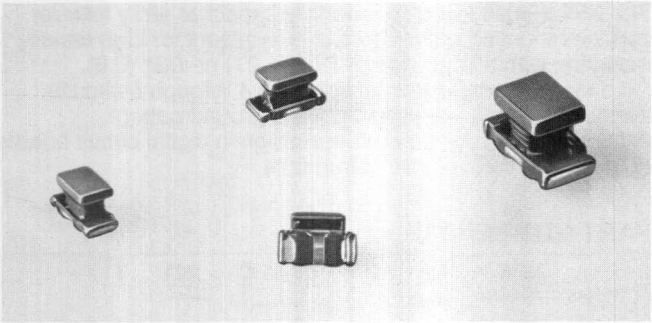
DIMENSIONS: in. (mm)



★All values are standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

EMI SUPPRESSION FILTERS
SURFACE MOUNT CHIP FILTERS

NFM51/52 Series



The NFM51/52R Series chip is an efficient signal line noise suppression filter for high-speed digital signal lines where base-band frequencies and noise band frequencies are very close.

Murata Electronics has combined its superior ceramic technologies with a unique circuit configuration to realize outstanding noise suppression effect in these applications. The NFM51/52R Series assures noise reduction to meet the specifications of CISPR, FCC, etc.

APPLICATIONS

Noise suppression for compact digital instruments, laptop personal computers, HDTV, EDTV, portable VTR, etc.

FEATURES

- Steep attenuation characteristics make this filter most suitable as a suppressor for unwanted radiation in signal lines without attenuating base-band frequencies.
- Chip configuration is most suitable for noise suppression in compact digital instruments, etc.
- Cut-off frequencies from 10MHz to 500MHz.

PART NUMBERING

NFM52R 00 P 106 T1

- **Signal Line Chip**
- **Class Number**
- **Circuit Style**
- **Cut-off Frequencies**
- **Packaging Code** T1 = Tape & Reel, B1 = Bulk

NFM51 SERIES

Part Number	Cut-off Frequency (MHz)	Minimum Attenuation (dB min.) 50 MHz	100 MHz	200 MHz	500 MHz	1 GHz	Rated Voltage (VDC)	Rated Current (mA)	Operating Temp. Range
★NFM51R00P506	50	*	10	30	30	30	25	200	–40 to +85°C
★NFM51R10P107	100	–	*	5	20	30			
★NFM51R20P207	200	–	–	*	10	30			
★NFM51R30P507	500	–	–	–	*	10			

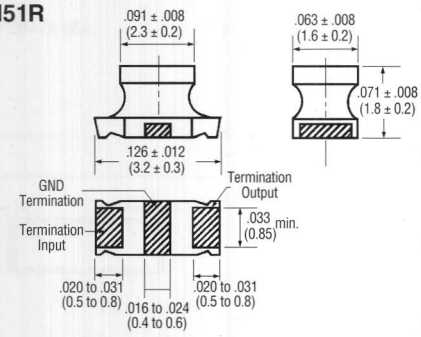
NFM52 SERIES

Part Number	Cut-off Frequency (MHz)	Minimum Attenuation (dB min.) 10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	Rated Voltage (VDC)	Rated Current (mA)	Operating Temp. Range
★NFM52R00P106	10	*	5	30	30	35	35	50	200	–25 to +85°C
★NFM52R10P206	20	–	*	20	30	35	35			
★NFM52R20P506	50	–	–	*	10	35	35			
★NFM52R30P107	100	–	–	–	*	10	35			

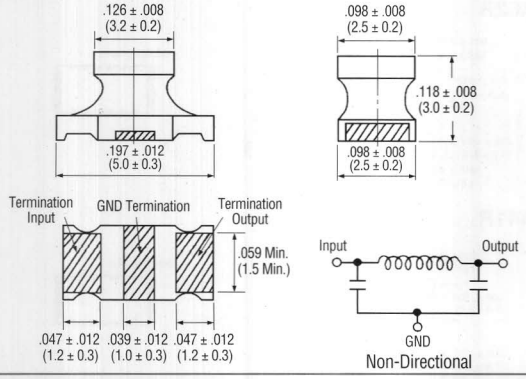
*6dB max.

DIMENSIONS: in. (mm)

NFM51R

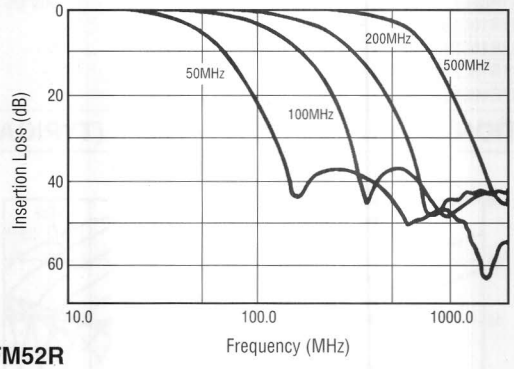


NFM52R

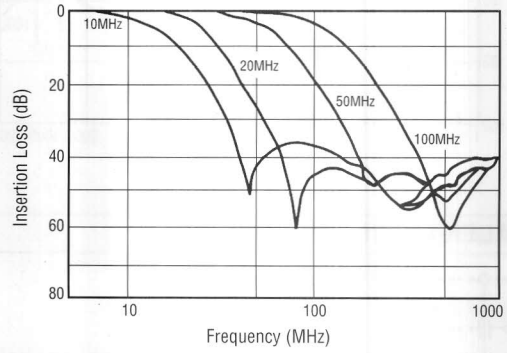


INSERTION LOSS CHARACTERISTICS (TYPICAL)

NFM51R

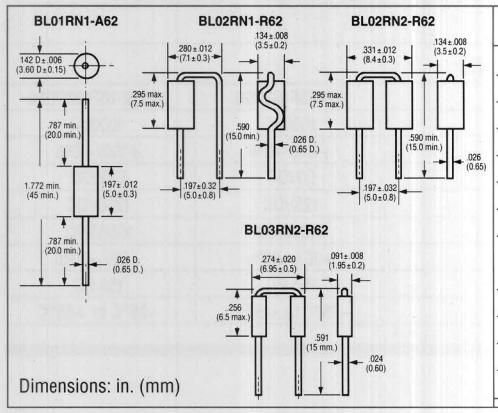


NFM52R



★All values are standard through authorized Murata Electronics Distributors: Standard packaging is tape and reel.

FERRITE BEAD INDUCTORS – BL01/BL02/BL03 SERIES



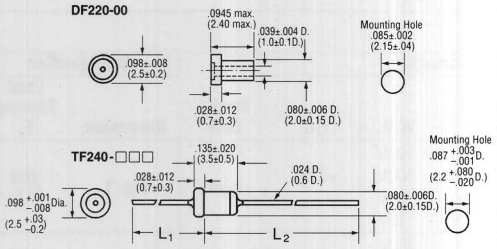
ELECTRICAL CHARACTERISTICS

Item		Characteristics
Permeability	(μi)	550
Saturation Magnetic	(Bs)	3100 (gauss)
Residual Magnetic Flux Density	(Brs)	1700 (gauss)
Coercive Force	(Hc)	0.3 (Oe)
Curie Point	(Tc)	130 (°C)
Temp. Coefficient	($\propto\mu r$)	20 x 10^{-6}
Relative Loss Factor		13 x 10^{-6}
	(DF/μi)	0.5 (MHz)
Resistivity	(ρ)	10^7 (Ω^{-cm})
Rated Current	BL01 & BL02 (A) Tape	6 A max.
	BL01 & BL02 (A) Bulk	7 A max.
	BL03	6 A max.

Part Number	Form
★BL01RN1-A62	Axial Single bead
★BL01RN1-A62T5	Axial Single bead, Taped
★BL02RN1-R62	Radial Single bead
★BL02RN2-R62	Radial Double bead
★BL02RN1-R62T2	Radial Single bead, Taped
★BL02RN2-R62T2	Radial Double bead, Taped
★BL03RN2-R62	Radial Double bead
★BL03RN2-R62T2	Radial Double bead, Taped

Environmental: Operating Temperature:–25°C to +85°C

FEED-THRU CAPACITORS – DF220/TF240 SERIES



Dimensions: in. (mm)

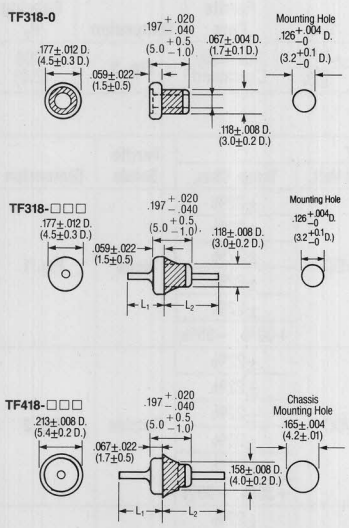
Part Number	L_1	L_2
TF240-601	.394±.039 (10±1.0)	.787±.079 (20±2.0)
TF240-602	.197±.039 (5±1.0)	.472±.039 (12±1.0)
TF240-603	.197±.039 (5±1.0)	.276±.039 (7±1.0)

SPECIFICATIONS

Part Number*	Cap. Value	Cap. Tol.	WVDC	DWV	Insertion Loss at 25°C 10MHz	100MHz	1GHz
★DF220-00SL020U50V	2pF	+0 –100	50V	125V	—	—	—
★DF220-00B121M50V	120pF	±20%	50V	125V	—	3	20
★DF220-00B221M50V	220pF	±20%	50V	125V	—	7	25
★DF220-00B471M50V	470pF	±20%	50V	125V	—	12	30
★DF220-00E102Z50V	1000pF	+80 –20%	50V	125V	3	18	35
★DF220-00SS152GMV50V	1500pF	+200 –0%	50V	125V	5	20	40
★TF240-□□□SL020D50V	2pF	±0.5pF	50V	125V	—	—	—
★TF240-□□□SL220M50V	22pF	±20%	50V	125V	—	—	7
★TF240-□□□B331M50V	330pF	±20%	50V	125V	—	10	27
★TF240-□□□SS332Z50V	3300pF	+80 –20%	50V	125V	10	25	45

For other capacitance values consult factory.
Operating Temp. Range: –25°C to +85°C Insulation Resistance: 100MΩ min.
□□□ — See DIMENSIONS

FEED-THRU CAPACITORS – TF318/TF418 SERIES



DIMENSIONS: In. (mm)

Type		L_1	L_2
★TF318-850	.032 (0.8)	.984±.079 (25.0±2.0)	1.18±.079 (30.0±2.0)
★TF318-853		.551±.040 (14.0±1.0)	.591±.040 (15.0±1.0)
★TF318-855		.374±.020 (9.5±0.5)	.433±.020 (11.0±0.5)
★TF318-053	.040 (1.0)	.433±.040 (11.0±1.0)	.650±.040 (16.5±1.0)
TF318-055		.276±.028 (7.0±0.7)	.244±.028 (6.2±0.7)
★TF318-450	.055 (1.4)	.177 +.040 −.020 (4.5 +1.0 −0.5)	.295±.040 (7.5±1.0)
★TF318-452		.276±.040 (7.0±1.0)	.354±.040 (9.0±1.0)
★TF418-452	.055 (1.4)	.283±.040 (7.2±1.0)	.347±.040 (8.8±1.0)
★TF418-454		.402±.040 (10.2±1.0)	.543±.040 (13.8±1.0)

SPECIFICATIONS

Part Number	Cap.	Cap. Tol.	Temp. Char.	Rated Volt.
TF318-□SL100G50V	10pF	±2pF	SL	50VDC
TF318-□SL220M50V	22pF	±20%	SL	50VDC
TF318-□SL330M50V	33pF	±20%	SL	50VDC
TF318-□SL470M50V	47pF	±20%	SL	50VDC
TF318-□YN101M50V	100pF	±20%	YN	50VDC
TF318-□B271M50V	270pF	±20%	B	50VDC
TF318-□B471M50V	470pF	±20%	B	50VDC
TF318-□E102GMV50V	1000pF	+200 −0%	E	50VDC
TF318-□E152P50V	1500pF	+100 −0%	E	50VDC
TF418-□E102MV300V	1000pF	+200 −0%	E	300VDC
TF418-□E152P300V	1500pF	+100 −0%	E	300VDC

□ Denotes configurations shown above.
Examples:
T318-450B271M50V
T418-452E102GMV300V

PART NUMBERING SYSTEM

TF318-450 E 102 GMV 50V

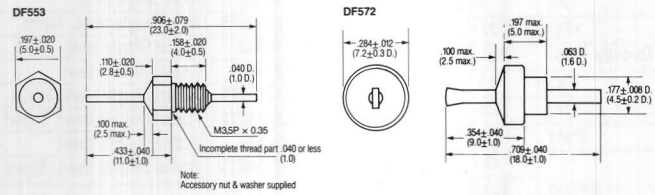
- Type and Dimensions
- Temperature Characteristics
- Rated Voltage: 50V and 300V* (*Available only in the TF418 Series)
- Cap. Tolerance
- Nominal Capacitance

Code	Max. Cap. Change	Temp. Range
B	±10%	-25°C — +85°C
E	+20/-55%	-25°C — +85°C

Code	Temp. Coefficient
SL	+350— -1000 ppm/°C
YN	-500— -5800 ppm/°C

★Available as standard through authorized Murata Electronics Distributors.

FEED-THRU CAPACITORS – DF553/DF572 SERIES



Dimensions: in. (mm)

SPECIFICATIONS

Part Number	DF553F102P50	DF572-10F102P500
Cap. Value	1000pF	1000pF
Cap. Tolerance	+100/−0%	+100/−0%
Rated Voltage	50VDC	500VDC
Dielectric Strength	125VDC	1250VDC
Insulation Resistance	10000MΩ	10000MΩ
Temp. Characteristic	+30/−80%	+30/−80%
Max. Feed-Thru Current	10A DC	15A DC
Operating Temp. Range	−25°C to +85°C	−25°C to +85°C

EMI SUPPRESSION FILTERS

DS310/DST310/DSS310 SERIES

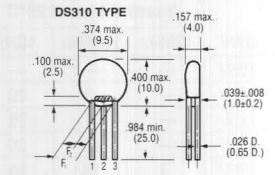


Figure 1

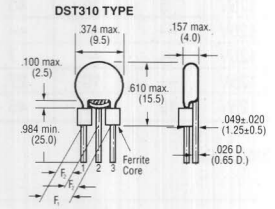


Figure 2

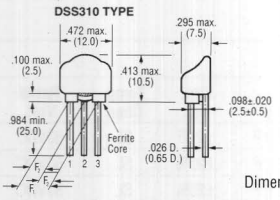


Figure 3

Dimensions: in. (mm)

SPECIFICATIONS

Part Number	Rated Current (Between Terminal)	Capacitor: Capacitance	Capacitor: W.V.	Capacitor: T.C.	Ferrite Core	Configuration: Dimension	Configuration: Lead Spacing F_2
★DS310-55Y5S271M100	7A max.	270pF±20%	100V	±22%	None	Fig. 1	.098 (2.5)
★DS310-55Y5S222M100		2200pF±20%	100V				
★DS310-55Y5S223S50		22000pF $^{+50}_{-20}$%	50V				
★DS310-55D104M16		100,000pF±20%	16V				
★DST310-55Y5S271M100	7A max.	270pF±20%	100V	±22%	Externally Mounted	Fig. 2	.098 (2.5)
★DST310-55Y5S222M100		2200pF±20%	100V				
★DST310-55Y5S223S50		22000pF $^{+50}_{-20}$%	50V				
★DSS310-55Y5S220M100	7A max.	22pF±20%	100V	±22%	Internally Contained	Fig. 3	.098 (2.5)
★DSS310-55Y5S470M100		47pF±20%	100V				
★DSS310-55Y5S101M100		100pF±20%	100V				
★DSS310-55Y5S271M100		270pF±20%	100V				
★DSS310-55Y5S222M100		2200pF±20%	100V				
★DSS310-55Y5S223S50		22000pF $^{+50}_{-20}$%	50V				

FOR AUDIO CIRCUITS (LOW DISTORTION TYPE)

Part Number	Rated Current (Between Terminal)	Capacitor: Capacitance	Capacitor: W.V.	Capacitor: T.C.	Ferrite Core	Configuration: Dimension	Configuration: Lead Spacing F_2
★DS310-55BL222M100	7A max.	2200pF±20%	100V	±10%	Internally Contained	Fig. 3	.098 (2.5)
★DS310-55DL223S50		22000pF $^{+50}_{-20}$%	50V	$^{+20}_{-30}$%			

DS306/DSS306/DST306 SERIES

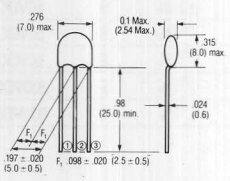


Fig. 1

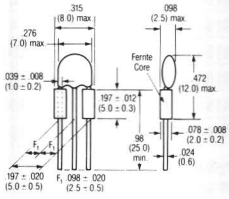


Fig. 2

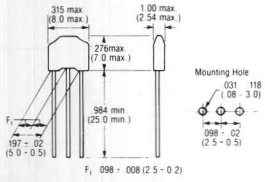


Fig. 3

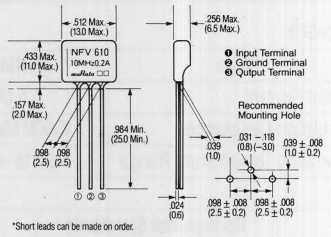
Dimensions: in. (mm)

- Coating extensions do not exceed the tangent line. Exposed electrode, if any, is covered by soldering, etc.
- Leads with length shorter than standard length are available when required. Contact us for further details.

Part Number	Capacitor: Capacitance	Capacitor: Rated Volt.	Capacitor: Temp. Char.	Ferrite Beads	Dimension
★DS306-55Y5S470M100	47pF±20%	50VDC	±22%	None	Fig. 1
★DS306-55Y5S101M100	100pF±20%		±22%		
★DS306-55Y5S271M100	270pF±20%		±22%		
★DS306-55Y5S102M100	1000pF±20%		±22%		
★DS306-55Y5S222M100	2200pF±20%		±22%		
★DS306-55FZ103Z50	10000pF+80%, −20%		+30%, −85%		
★DST306-55Y5S470M50	47pF±20%	50VDC	±22%	Outside	Fig. 2
★DST306-55Y5S101M50	100pF±20%		±22%		
★DST306-55Y5S271M50	270pF±20%		±22%		
★DST306-55Y5S102M50	1000pF±20%		±22%		
★DST306-55Y5S222M50	2200pF±20%		±22%		
★DST306-55FZ103Z50	10000pF+80%, −20%		+30%, −85%		
★DSS306-55Y5S470M100	47pF±20%	100VDC	±22%	Inside	Fig. 3
★DSS306-55Y5S101M100	100pF±20%		±22%		
★DSS306-55Y5S271M100	270pF±20%		±22%		
★DSS306-55Y5S471M100	470pF±20%		±10%		
★DSS306-55Y5S102M100	1000pF±20%		±22%		
★DSS306-55Y5U222Z100	2200pF+80%, −20%		+22%, −56%		
★DSS306-55FZ103N100	10000pF±30%		+30%, −85%		

★Available as standard through authorized Murata Electronics Distributors.

NFV610 SERIES



*Short leads can be made on order.

Dimensions: in. (mm)

SPECIFICATIONS

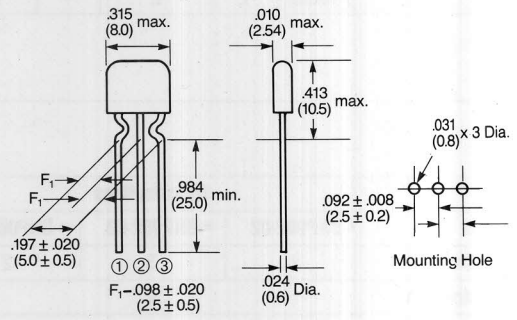
Part No.	Cut-Off Frequency	Minimum Attenuation (dB)					
		10MHz	20MHz	50MHz	100MHz	200MHz	500MHz
★NFV610-655 T2A 106	10MHz	*	3	10	20	35	25
★NFV610-655 T2A 206	20MHz		*	3	10	15	25
★NFV610-655 T2A 506	50MHz			*	3	10	25
★NFV610-655 T2A 107	100MHz				*	3	15

*6dB max

Rated Voltage: 100 VDC, Rated Current: 200mA
Temperature Range: –25°C to +85°C

EMI-GUARD VARISTOR-CAPACITOR DSS706 SERIES

DIMENSIONS: in. (mm)

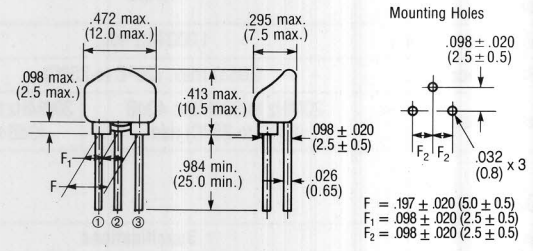


RATINGS

Part No.	DSS706-351D221M25-50
Rated Voltage	25VDC
Varistor voltage	50V±20%
Rated current	6ADC
Operating Temp. Range	– 40 to +105°C
Capacitance	220pF±20%
Capacitance Temp. Char.	+20%, –30%

DSS710 SERIES

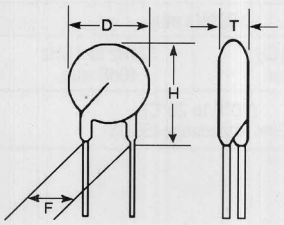
DIMENSIONS: in. (mm)



Part No.	DSS710 D 223S 12-22
Capacitance	22000pF $^{+50}_{-20}$ %
DF	5.0% max.
Insulation Resistance	1 MΩ min.
I_c (max.)	7 A max.
Rated Voltage	12 VDC
Varistor Voltage	22 VDC ± 20% (V1mA)
Voltage Nonlinear Factor	1.25 max. (V10mA/V1mA)
Temperature Characteristics	$^{+20}_{-30}$% (–25 to +85°C)
Operating Temperature Range	–40 to +100°C
Inductance	0.8μH × 2 (1 KHz)

VARISTOR-SURGE ABSORBER – DVZ SERIES

DIMENSIONS: in. (mm)



Part No.	Maximum Allowable Voltage		Maximum Clamping Voltage		Varistor Voltage	With-standing Surge Current(A)
	ACrms(V)	DC(V)	Vc(V)	Ip(A)		
★DVZ07-551A221	140	180	360	10	220±10%	600
★DVZ10-551A221			360	25		1250
★DVZ07-551A431	275	350	710	10	430±10%	600
★DVZ10-551A431			710	25		1250

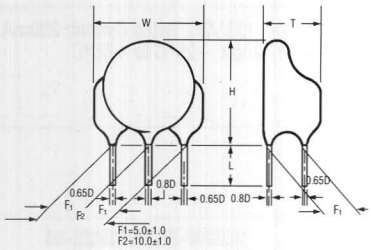
Do not exceed Max. allowable voltage.
Flux: Use rosin-based flux, but not strong acidic flux (with chlorine content exceeding 0.20wt%).
Operating Temperature Range: –40 to +85°C

Size	D	H	T	F
7 type	.354 (9.0) max.	.472 (12.0) max.	.209 (5.3) max. to .264 (6.7) max.	.177±.039 (5.0±1)
10 type	.551 (14.0) max.	.669 (17.0) max.	.224 (5.7) max. to .284 (7.2) max.	295±.039 (7.5±1)

★Available as standard through Murata Electronics Distributors.

AC THREE TERMINAL CAPACITOR

Dimensions: (mm)



Part No.	W	H	T	L
DSR1100	16.0 max.	15.0 max.	11.0 max.	6.0
DSR1120	16.0 max.	17.0 max.	11.0 max	
DSR1150	18.0 max.	22.0 max.	11.0 max.	

RATINGS

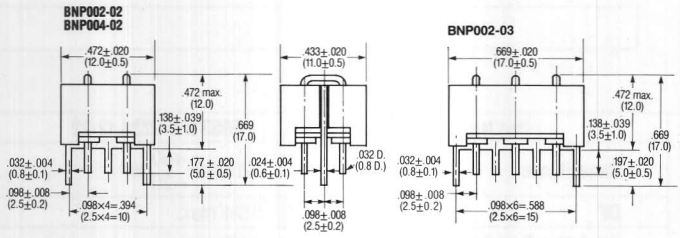
Item	Ratings
Rated Current	7 A (AC)
Insulation Resistance	10000 MΩ min.
Operating Temperature Range	−25 to +85°C

Part No.	Temp. Char.	Cap. Value (pF)	Cap. Tol (%)	Recognized Standards UL 1414	CSA C22.2 No. 1	VDE 565-1	Rated Voltage*
★DSR1100-56 E222M VA2-EA	E	2200	±20	£	£	£	VA2
★DSR1120-56 E302M VA2-EA	E	3000	±20	£	£	£	VA2
★DSR1150-56 E472M VA2-EA	E	4700	±20	£	£	£	VA2
★DSR1100-56 FZ472P AC125-EA	$^{+30}_{-85}$%	4700	±100/0	£	£	-	VA2

*VA2: for VDE565-1 SEMKO, BSI . . . 250VAC
for UL1414, CSA C22.2 No. 1 . . . 125VAC

EMI SUPPRESSION FILTERS – 15MHz TO 1GHz – BNP002/004

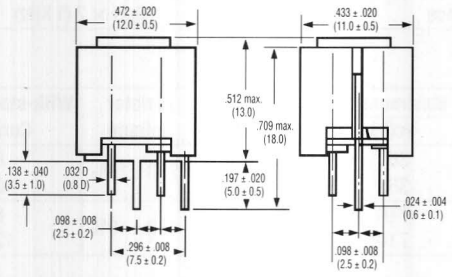
Dimensions: in. (mm)



Item	Specifications		
Part Number	★BNP002-02	★BNP002-03	★BNP004-02
Number of Circuits	2	3	2
Circuit Construction	π		
Operating Temperature Range	−40°C to + 100°C		
Rated Voltage	50VDC		
Withstand Voltage	300VDC		125VDC
Maximum Current Capacity	10ADC		
Insulation Resistance	1,000 MΩ min.		
DC Resistance	0.05 Ω max. (20°C to 25°C)		
Insertion Loss	20MHz to 500MHz: 40dB (20°C to 25°C) min.		300MHz to 1GHz 40dB min.

EMI SUPPRESSION FILTERS – 0.5MHz TO 1GHz – BNX002/003

Dimensions: in. (mm)

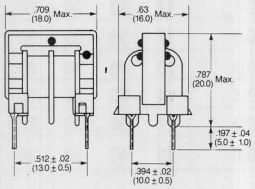


Item	Specifications	
Part Number	★BNX002-01	★BNX003-01
Operating Temperature Range	−30°C to +85°C	
Rated Voltage	50VDC	150V
Test Voltage	125VDC	375V
Maximum Current Capacity	10ADC	
Insulation Resistance	100MΩ min.	
Insertion Loss	1MHz to 1GHz 40dB min.	5MHz to 1GHz 40dB min.
	(20°C to 25°C) (line impedance=50Ω)	

★Available as standard through authorized Murata Electronics Distributors.

NOISE FILTERS
AC COMMON MODE CHOKE COIL — Series PLA

Dimensions: in. (mm)



ELECTRICAL SPECIFICATIONS

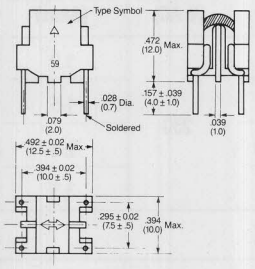
Item	Ratings
Rated Voltage	250VAC
Dielectric Strength (between coils)	2000VAC, 1 min. 2400VAC, 1 sec.
Insulation Resistance	100MΩ min.
Operating Temperature Range	−25°C to +60°C
Storage Temperature Range	−25°C to +85°C
Temp. Characteristics Inductance	$^{+80}_{-50}$%

SPECIFICATIONS

Type	Inductance (mH) min.	Rated Current (Arms)	DC Resistance (Ω) max.	Self-Resonant Frequency (MHz) Typical
★PLAA1021R0R01B1	1.0	1	0.25	1.0
★PLAA2021R0R01B1	2.0	1	0.30	0.7
★PLAA3021R0R01B1	3.0	1	0.35	0.5
★PLAA1022R0R01B1	1.0	2	0.15	1.0
★PLAA1522R0R01B1	1.5	2	0.20	0.9

NOISE FILTERS
DC COMMON MODE CHOKE COIL — Series PLT

Dimensions: in. (mm)



TYPES

Part Number	Inductance (μH) min.	Self-Resonant Frequency (MHz)*	Code
★PLT0R53C	0.5	1000 min.	B
★PLT1R53C	1.5	250	A
★PLT2003C	20.0	10	C

*Typ.

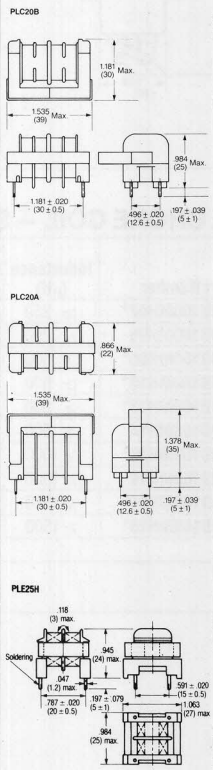
SPECIFICATIONS

Item	Rating
Rated Voltage	50VDC
Rated Current	3A
Withstand Voltage	125VDC (1 to 5 sec.)
Operating Temp. Range	−25°C to +60°C

★Available as standard through authorized Murata Erie Distributors.

NOISE FILTERS
AC COMMON MODE CHOKE COIL — Series PLC/PLE

Dimensions: in. (mm)



SPECIFICATIONS

Part Number	Inductance (mH) min.	Rated Current (Arms)	DC Resistance (Ω) max.	Self-Resonant Frequency (MHz) Typical
★PLC20B7030R5D01B1	70	0.5	3.0	0.1
★PLC20B3031R0D01B1	30	1.0	1.0	0.2
★PLC20B1131R5D01B1	11	1.5	0.4	0.3
★PLC20B6522R0D01B1	6.5	2.0	0.2	0.4
★PLC20B3023R0D01B1	3	3.0	0.1	0.7
★PLC20A7030R5D01B1	70	0.5	3.0	0.1
★PLC20A3031R0D01B1	30	1.0	1.0	0.2
★PLC20A1131R5D01B1	11	1.5	0.4	0.3
★PLC20A6522R0D01B1	6.5	2.0	0.2	0.4
★PLC20A3023R0D01B1	3	3.0	0.1	0.7
★PLE25H-3030R5	30	0.5	1.2	0.1
★PLE25H-2230R7	22	0.7	1.0	0.1
★PLE25H-1531R	15	1.0	0.7	0.1
★PLE25H-1131R3	11	1.3	0.6	0.15
★PLE25H-8021R5	8	1.5	0.4	0.2
★PLE25H-3022R	3	2.0	0.2	0.25
★PLE25H-2023R	2	3.0	0.1	0.4

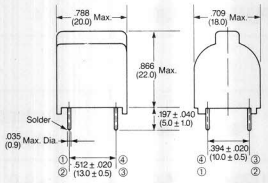
ELECTRICAL RATINGS

Item	Rating
Rated Voltage	250VAC
Withstand Voltage (between coils)	One minute at 2000VAC
Insulation Resistance (between coils: 500VDC)	100MΩ min.
Operating Temp. Range	−25°C to +60°C
Temp. Char. (Inductance)	$^{+80}_{-50}$% (−25°C to +60°C, 20°C base)

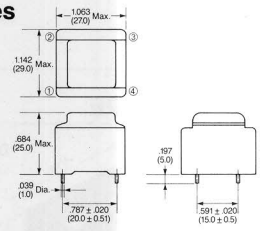
AC COMMON MODE CHOKE COIL LARGE CURRENTS AND LARGE INDUCTANCE

Dimensions: in. (mm)

PLAM Series



PLEM Series



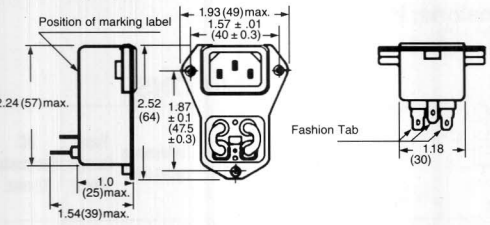
Part Number	Inductance (mH) min.	Rated Voltage (VAC)	Rated Current (Arms)
PLAM2930R5	29.0	250 (for UL1414, Europe) 125 (for CSA C22.2 No. 1)	0.5
PLAM2230R6	22.0		0.6
PLAM1030R9	10.0		0.9
PLAM4621R3	4.6		1.3
PLAM2321R9	2.3		1.9
PLEM-3331R0D	33	250 (For Japan, USA, Europe) 125 (For Canada)	1.0
PLEM-1431R5D	14		1.5
PLEM-8222R0D	8.2		2.0
PLEM-5422R5D	5.4		2.5
PLEM-3623R0D	3.6		3.0
PLEM-2024R0D	2.0		4.0

Operating Temperature Range: −25°C to +60°C

★Available as standard through authorized Murata Electronics Distributors.

NOISE FILTERS – PLI-C

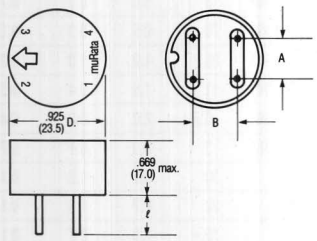
DIMENSIONS: in. (mm)



Part Number	Circuit Composition: Across-the-line Capacitor	Circuit Composition: Discharge Resistor	Leakage Current (mA max.)	Insertion Loss (dB) Line to ground (MHz) 10	30	100	300
PLI-C1020	inside	none	0.4	14	30	30	20
PLI-C1030			0.5	17	36	30	20
PLI-C1040			0.8	20	40	30	20
PLI-C2020	none	inside	0.4	14	30	30	20
PLI-C2030			0.5	17	36	30	20
PLI-C2040			0.8	20	40	30	20

NOISE FILTERS – COMMON MODE CHOKE COIL – Series FKOB

DIMENSIONS: in. (mm)



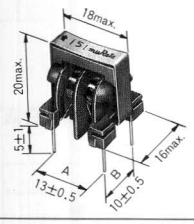
DIMENSIONS: in. (mm)

Part Number	Inductance (μH)	RDC (mΩ)	Rated Volt. (V AC)	Rated Current (Arms)	Freq. at Self-Resonance (MHz)	Lead Pitch A/B	Lead Length ℓ
★FKOB160MH02*	≥ 250	< 50	125 (250)	2.5	5	.315 (8) / .394 (10)	.394 (10)
★FKOB160MH06	≥ 250	< 50	125 (250)	2.5	5	.512 (13) / .394 (10)	.177 (4.5)
★FKOB160MH25*	≥ 600	< 80	125 (250)	2.5	4	.315 (8) / .394 (10)	.394 (10)
★FKOB160MH13*	≥ 600	< 80	125 (250)	2.5	4	.512 (13) / .394 (10)	.177 (4.5)
★FKOB160MH23*	≥ 800	< 80	125 (250)	2.5	3.5	.315 (8) / .394 (10)	.394 (10)
FKOB160MH14	≥ 800	< 80	125 (250)	2.5	3.5	.512 (13) / .394 (10)	.177 (4.5)
★FKOB160MH26*	≥ 1000	< 100	125 (250)	1.5	2.5	.315 (8) / .394 (10)	.394 (10)
FKOB160MH16	≥ 1000	< 100	125 (250)	1.5	2.5	.512 (13) / .394 (10)	.177 (4.5)
★FKOB160MH24*	≥ 1500	< 120	125 (250)	1.5	1.5	.315 (8) / .394 (10)	.394 (10)
★FKOB160MH15*	≥ 1500	< 120	125 (250)	1.5	1.5	.512 (13) / .394 (10)	.177 (4.5)

*Standard units

COMMON MODE CHOKE COILS

PLH11L Series

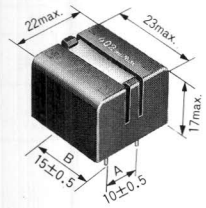


DIMENSIONS: (mm)

Part Number	Inductance (μH)	RDC (Ω)	Rated Volt. (V. AC)	Rated Current (Arms)
★PLH11A1811R2P01B1	≥ 180	<0.15	250	1.2
★PLH11A1511R5P01B1	≥ 150	<0.10		1.5
★PLH11A8002R2P01B1	≥ 80	<0.07		2.2
★PLH11A6003R3P01B1	≥ 60	<0.05		3.3

WIDE BAND FREQUENCY TYPE

PLH14H Series



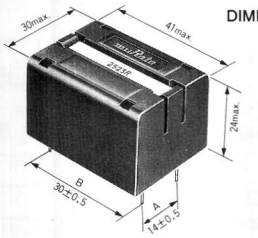
DIMENSIONS: (mm)

Part Number	Inductance (mH min.)	RDC (Ω)	Rated Volt. (V. AC)	Rated Current (Arms)
PLH14H-4020R5	4.0	<3.0	250	0.5
PLH14H-2420R8	2.4	<1.0		0.8
PLH14H-8011R7	0.8	<0.5		1.7
PLH14H-4013R0	0.4	<0.1		3.0

WIDE BAND FREQUENCY TYPE

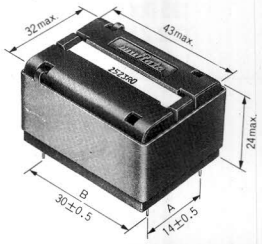
PLH20H Series

DIMENSIONS: (mm)



Part Number	Inductance (mH)	RDC (Ω)	Rated Volt. (V. AC)	Rated Current (Arms)
★PLH20H/20HM-9021R0	≥9.0	<1.0	250	1.0
★PLH20H/20HM-4622R0	≥4.6	<0.3		2.0
★PLH20H/20HM-2523R0	≥2.5	<0.1		3.0
★PLH20H/20HM-8016R0	≥0.8	<0.1		6.0

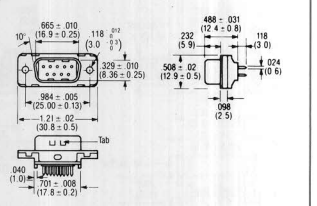
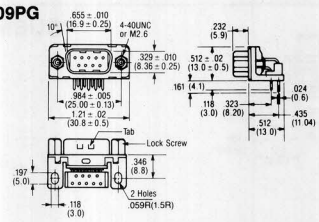
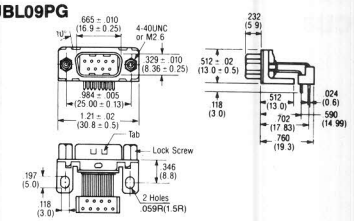
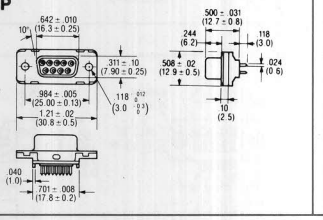
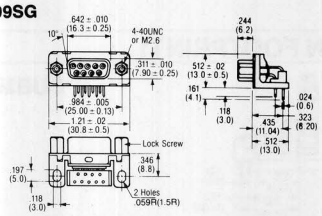
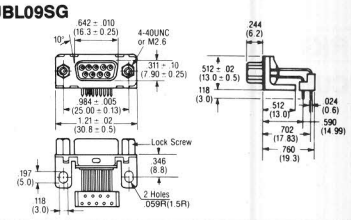
PLH20HM Series (SHIELDED)



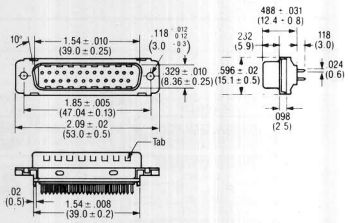
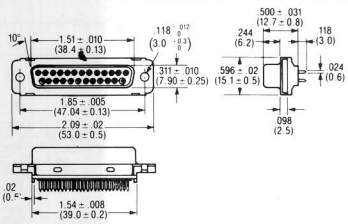
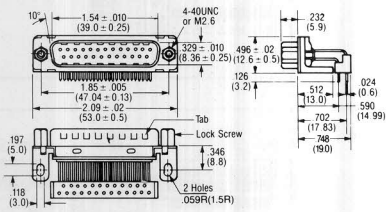
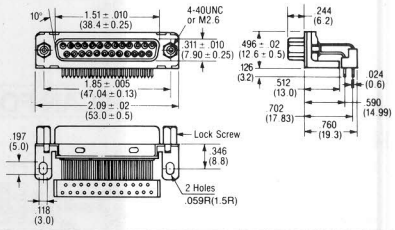
★Available as standard through authorized Murata Electronics Distributors.

CUBL09 & 25 SERIES

EMI SUPPRESSION D-CONNECTORS – CUBL09 SERIES

	STRAIGHT	RIGHT ANGLE	RIGHT ANGLE (American Foot Print)
PIN	★CUBL09PP 	★CUBL09PG 	★CUBL09PG 
SOCKET	★CUBL09SP 	★CUBL09SG 	★CUBL09SG 

EMI SUPPRESSION D-CONNECTOR – CUBL25 SERIES

★PP TYPE		★SP TYPE	
★PN TYPE		★SN TYPE	

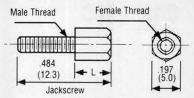
PART NUMBERING SYSTEM

CUBL 25 P N 25 C 002 NC

Connector Type
Number of Lines
9 Lines
25 Lines
Mating
P—Plug
S—Socket
Configuration
P=Straight
G=Right Angle (Std.)
N=Right Angle
(North American Footprint)
Number of Filtered Lines
Filter Type
C=Capacitor

North American Std.	Capacitance
001	2000pF + 125%, –25%
002	1000pF + 80%, –20%
003	500pF ± 30%
004	250pF ± 30%
005	120pF ± 30%
006	43pF ± 30%

Mounting Hardware



Available in Right Angle Configuration

Jackscrew	Male Thread	Female Thread	L in. (mm)
Blank	M2.6	M2.6	.248 (6.3)
D	4-40 UNC	4-40 UNC	.248 (6.3)
E	M2.6	M2.6	.189 (4.8)
NA	Without Lockscrew, Rear Shell M2.6 Female Thread		
NC	Without Lockscrew, Rear Shell 4-40 UNC Female Thread		

SPECIFICATIONS

Number of Lines	9, 25
Operating Temperature	–25°C to +85°C
Rated Voltage	100VDC
Test Voltage	250VDC
Rated Current	5A max.
Insulation Resistance	1000MΩ min.

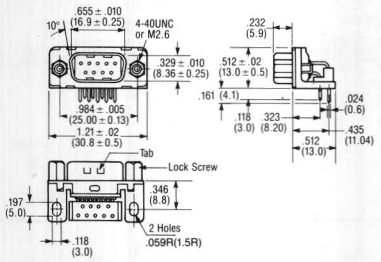
★Available as standard through authorized Murata Electronics Distributors.

DIMENSIONS: in. (mm)

PIN	SOCKET

RIGHT ANGLE (STANDARD)

***CUBM09PG**



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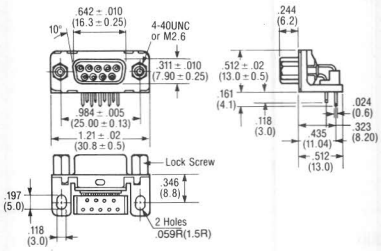
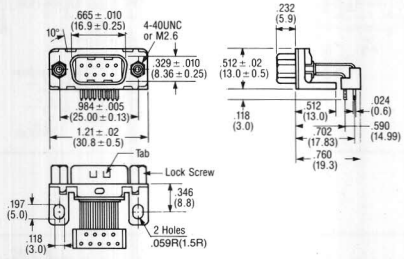


RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

***CUBM09PN**



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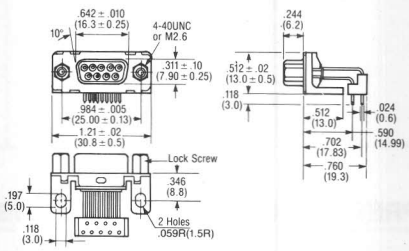
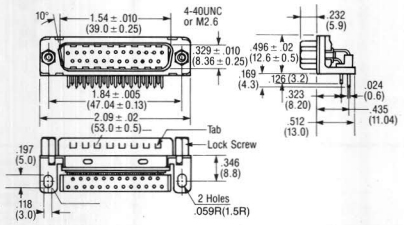
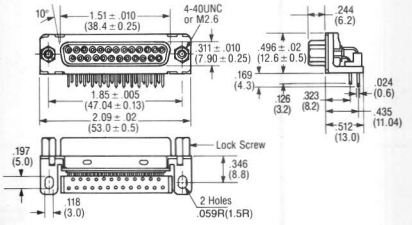


RIGHT ANGLE (STANDARD)

***CUBM25PG**

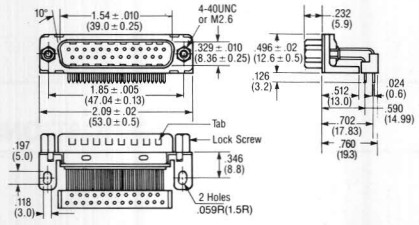


***CUBM25SG**

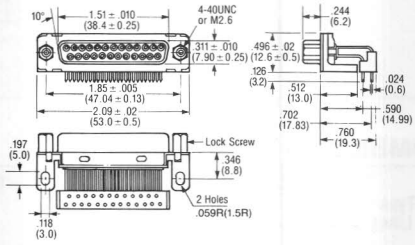


RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

***CUBM25PN**



***CUBM25SN**



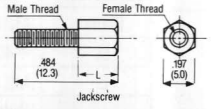
PART NUMBERING SYSTEM

CUBM 25 P N 25 C 002 NC

Connector Type
Number of Lines
9 Lines
15 Lines
25 Lines
Mating
P—Plug
S—Socket
Configuration
P=Straight (15 lines only)
G=Right Angle (Std.)
N=Right Angle
(North American Footprint)
Number of Filtered Lines
Filter Type
C=Capacitor

Capacitance Value	Tolerance
001—2000 pF	−25%, +125%
002—1000 pF	−20%, +80%
003— 500 pF	±30%
004— 250 pF	±30%
005— 120 pF	±30%
006— 43 pF	±30%

Mounting Hardware



Available in Right Angle Configuration

Jackscrew	Male Thread	Female Thread	L in. (mm)
Blank	M2.6	M2.6	.248 (6.3)
D	4-40 UNC	4-40 UNC	.248 (6.3)
E	M2.6	M2.6	.189 (4.8)
NA	Without Lockscrew, Rear Shell M2.6 Female Thread		
NC	Without Lockscrew, Rear Shell 4-40 UNC Female Thread		

SPECIFICATIONS

Number of Lines	9, 15, 25
Operating Temperature	−25°C to +85°C
Rated Voltage	100VDC
Test Voltage	250VDC
Rated Current	5A max.
Insulation Resistance	1000MΩ min.

*Available as standard through authorized Murata Electronics Distributors.

FILTERED "D" CONNECTOR LOW COST

muRata

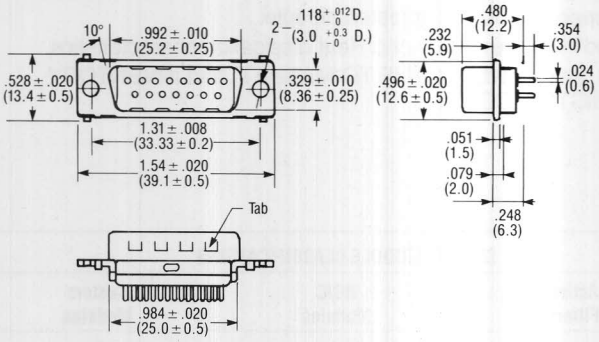
CUBN15 SERIES

DIMENSIONS: in. (mm)

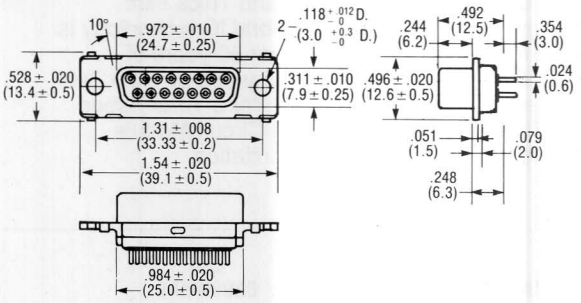
PIN	SOCKET

STRAIGHT

★CUBN15PT

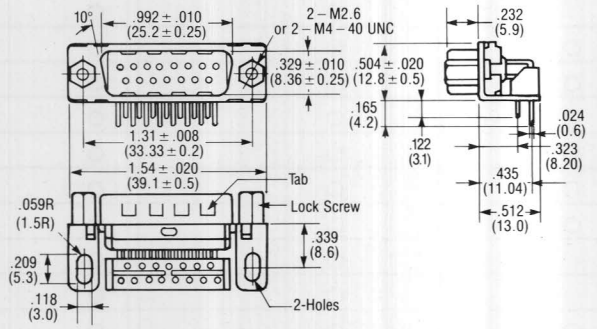


★CUBN15ST

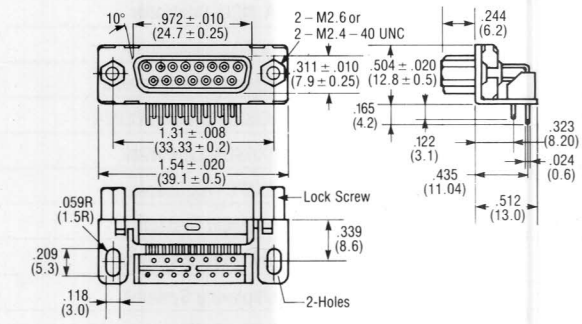


RIGHT ANGLE (STANDARD)

★CUBN15PG

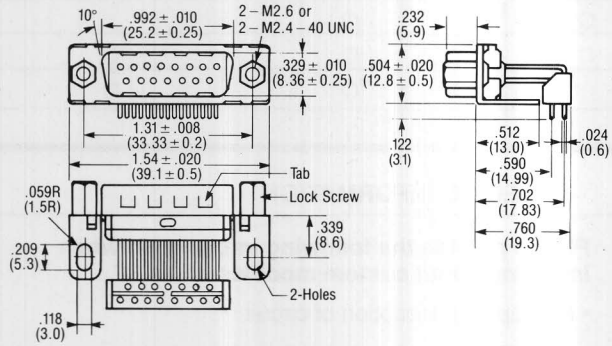


★CUBN15SG

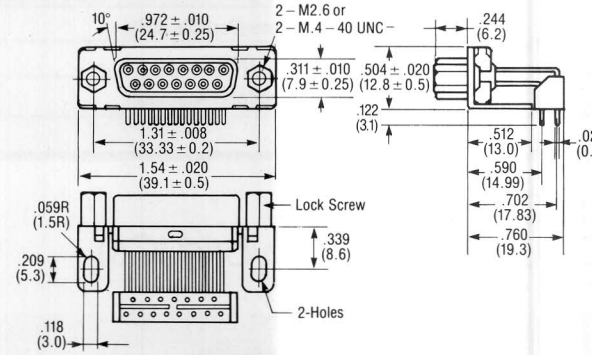


RIGHT ANGLE (NORTH AMERICAN FOOTPRINT)

★CUBN15PN

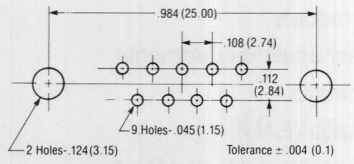


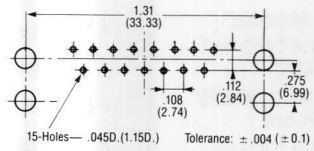
★CUBN15SN

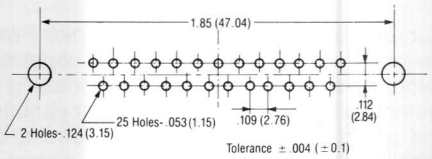


RECOMMENDED PC BOARD MOUNTING HOLES DIMENSIONS

CUBN09	CUBN15	CUBN25



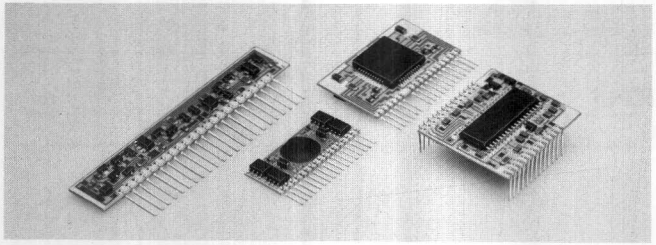




★Available as standard through authorized Murata Electronics Distributors.

		Filters	Modules	Modules
COMPUTER	PC, Mini, Super, Notebook	○	○	○
	FDD, HDD, CD-ROM		○	○
	I/O, Interface, SCSI		○	○
	FA, NCU, Controller		○	○
	Data Acquisition/Instr.	○	○	○
	CD-Interactive, Multimedia	○	○	○
COMMUNICATIONS	TDMA/GSM/PCN/GPS/CDMA	○	○	○
	PBX/ISDN/LAN/WAN	○	○	○
	FAX/PC FAX Boards	○	○	○
	Handheld Systems	○	○	○
AUTOMOTIVE	Engine Control Systems		○	○
	Multiplexing Systems		○	○
	Car Audio Systems	○	○	○
	Car Alarms/Controls		○	○
CONSUMER	Digital Audio/Pro	○	○	
	Home/Portable Audio	○	○	
	DBS Tuners	○	○	○
	Electronic Appliances		○	○

CUSTOM CIRCUIT MODULE DESIGN (Hybrid ICs)



Murata Electronics offers custom Thick Film Circuit Module design engineering and production capabilities. Our advanced computer aided design and manufacturing (CAD/CAM) systems allow us to respond to your various needs with quality and speed. If you have an application that could use our established Thick Film Technology, please contact us for engineering consultation.

ORDERING INFORMATION

Please provide the following information when inquiring about custom modules:

- Functional description of circuit
- Application
- Schematic
- Bill of materials
- Package type preferred (SIP or DIP or SMD)
- Package dimensions (L x W x H) (Max.)
- Your target cost for module
- Your development schedule requirements
- Your production schedule
- Expected annual usage (EAU)
- Your technical contact, phone #, and fax #

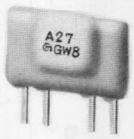
★Note: One of our design engineers will contact you to discuss the design following our own preliminary evaluation. We will suggest the most cost effective methods to achieve your objectives together with the applicable technology. The design up to final production remains flexible and changes may be made to meet changing requirements.

ACTIVE FILTERS

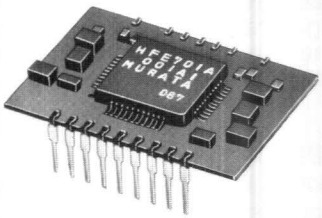
Murata Electronics Active Filters have achieved high performance and excellent quality by utilizing standard Thick Film processes and our own original circuit technology.

FEATURES

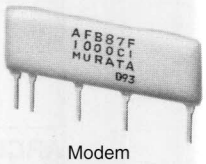
- High Density/Miniturization acheived by use of Multi-Layer, Fine Line, and Through Hole Hybrid IC Technology.
- Laser Trim technology allows high accuracy and high performance designs.
- VE (Value Engineering) provided by Murata engineers.
- Frequency Ranges 10Hz~500KHz.
- Semi-Custom and Custom design support.



Cellular/2-way radio



Car audio graphic equalizer and electronic volume



Modem

Note: SMD Filter AF & RC Networks Also Available

HOW TO REQUEST MURATA FILTERS

Provide the following information:

1. Frequency characteristics (Graph, Data, or Schematic).
2. Package style and size required.
3. Filter application and reliability specifications.
4. Estimated annual usage.
5. Your project schedule.
6. Your engineering contact, telephone and fax number.

HOW MURATA WILL RESPOND

1. Engineering consultation (if required).
2. Specification, tooling charge, and pricing based on your request.

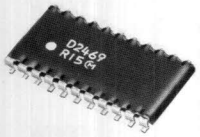
Low cost standard, Low pass audio filter designs: (Minimum order quantities of 500pcs–Made to order)

P/N	Pass Rand (Hz)	Filter Order	Type	T.H.D. %	Dimensions L x W x H (mm)
AFL25F3000S10	20 to 3KHz	5	Tchebycheff with Poles	.003	14 x 4 x 9
AFL89F8000D1	20 to 8 KHz	9	Tchebycheff with Poles	.003	38 x 17 x 5.5
AFL89F10000D1	20 to 10K	9	Tchebycheff with Poles	.003	
AFL89F15000D1	20 to 15K	9	Tchebycheff with Poles	.003	
AFL89F20000D1	20 to 20K	9	Tchebycheff with Poles	.003	
AFL89F22000D1	20 to 22K	9	Tchebycheff with Poles	.003	

SEMI – STANDARD DESIGN

EXAMPLES OF MURATA HYBRID IC:

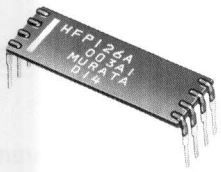
Single Ended Passive



18 Circuit SMD Type

LCD Display

5V → –22V



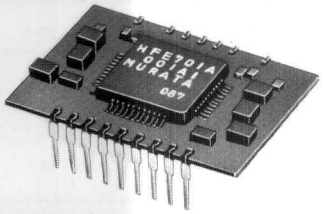
5 → 5V
5 → 12V
5 → 15V
24 → 5V
48 → 5V

HFP143DH05121A1 **HFP143DJ05121A1**

DC – DC CONVERTORS

- Notebook/Handheld PC's
- Barcode readers
- Communication Equipment
- Telecommunication/PBX

GRAPHIC EQUALIZER FOR CAR AUDIO



Also Available: RDS module; Fixed EQ's; AM Stereo Decoders; AM Beat Filters

CIRCUIT MODULE (HYBRID IC)
RC MODULE (ARC, ARCL & CNTL SERIES)

Murata's RC-Module is a thick-film module using Murata's own alumina substrate, thick-film resistors and chip monolithic ceramic capacitors.

APPLICATIONS

- Noise suppression in all electronic equipment.
- EMI/RFI filtering.
- HVAC, PC's, appliance, test equipment, audio, automotive (85°C), factory automation, and communication equipment.

FEATURES

- Low profile/small size.
- 1.78mm & 2.54mm lead pitch.
- Excellent quality/reliability.
- 3-pin taping (5~9 pin) for automation.
- Custom designs also available.
- R's & C's E 12 values.

E 12 VALUES

10	22	47
12	27	56
15	33	68
18	39	82

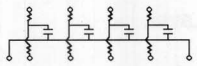
Value (Code)

Example: 22pF(220k), 220pF(221k), 10Ω(100J), 100Ω(101J)

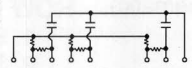
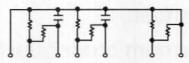
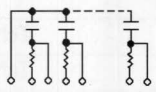
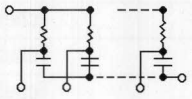
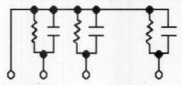
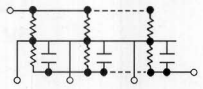
MECHANICAL SPECIFICATIONS

Substrate:	Alumina 96%
Resistor:	Cermet
Capacitor:	Monolithic ceramic
Coating:	Meets UL94V–0
Conductor:	Copper (Cu)
Lead Frame:	Steel dipped in solder

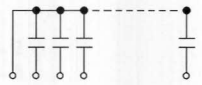
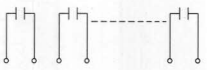
ARC series

Circuit Type	Circuit Composition	Number of Elements	Power Rating	Rated Voltage (C)	Lead Pitch (Options)	Height
D ①		R=8 C=4 P=10	100mW	50V 25V if capacitance is 68000pF or 0.1μF.	2.54 (mm)	MAX 7.6 (mm)
I ①		R=4~10 C=4~10 P=5~11	100mW	50V 25V if capacitance is 68000pF or 0.1μF.	2.54 (mm)	MAX 7.6 (mm)

ARCL series

F ②		R=4~10 C=2~5 P=6,8,10,12	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)
G ②		R=4~10 C=2~5 P=5,7,9,11	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)
L ②		R=2~5 C=2~5 P=5,7,9,11	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)
S ②		R=3~9 C=3~9 P=5~11	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)
X ②		R=4~10 C=4~10 P=5~11	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)
Z ②		R=6~18 C=3~9 P=5~11	100mW	50V 25V if capacitance is 68000pF or 0.1μF	2.54/1.78 (mm)	MAX 5.5 (mm)

CNTL series

X ②		C=4~11 P=5~12	100mW	50V 25V if capacitance is 68000pF or 0.1μF.	2.54/1.78 (mm)	MAX 5.5 (mm)
Y ②		C=3~6 P=6,8,10,12	100mW	50V 25V if capacitance is 68000pF or 0.1μF.	2.54/1.78 (mm)	MAX 5.5 (mm)

Note: 1. R=Resistor, C=Capacitor, P=Number of Pins (Leads).
2. 3-Pin taping available for 5 pins to 9 pins (1Kpcs Quantity's)(CNTL & ARCL only).

HOW TO BUILD PART NUMBER

You Need		PN for 2.54mm Pitch	PN for 1.78mm Pitch
• 8 cap., 9-pin, X type CNTL, 1000pF	=	CNTL9XW102M	CNTL9XS102M
• 9R, 9C, 10-pin, I type ARC 56 ohms, 100pF	=	ARC10I560J101K	n/a
• 9R, 9C, 11-pin, S type ARCL 1,000Ω, 10,000pF	=	ARCL11L102J103M	ARCL11LS102J103M

RATINGS (ARC, ARCL, CNTL SERIES)

Resistor	Rating	100mW/Element			
	Resistance	10Ω~1MΩ (E12 Series)			
	Tolerance	J: ±5%			
	Temp. Char.	±250ppm/°C			
Capacitor	Capacitance	22pF~ 470pF (E12)	560pF~ 15000pF (E12)	22000pF 33000pF 47000pf	68000pF 0.1μF
	Tolerance	±10%	±20%	±80%/–20%	
	Temp. Char.	COG	X7R	Y5V	
Rated Voltage		50V			25V
Operating Temp. Range (Topr)		–35°C~+80°C			
Storage Temp. Range (Tstg)		–40°C~+85°C			

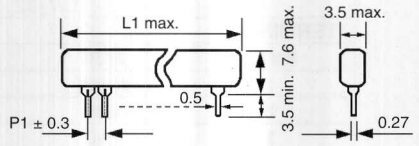
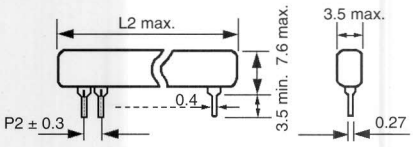
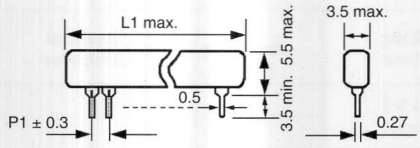
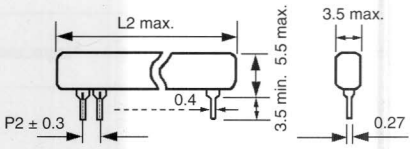
Note: These parts are for use in industrial and consumer related electronic equipment. DO NOT USE for critical applications such as airbag, ABS brakes, or life sustaining medical equipment. Contact Murata Electronics engineers for such applications.

LENGTH: mm

※ Number of Pins	5	6	7	8	9	10	11	12
L1 Length (Max.)	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5
L2 Length (Max.)	11.5	13.5	15.0	17.0	19.0	20.5	22.5	24.0

※ Please inquire for RC-Modules with the number of pins not listed above.

DIMENSIONS:

Dimensions (ARC) (Unit: mm)		
Lead-Pitch	P1=2.54mm (Inch-pitch) (W)	P2=1.78mm (Shrink-pitch) (S)
Dimensions (ARCL, CNTL) (Unit: mm)		
Lead-Pitch	P1=2.54mm (Inch-pitch) (W)	P2=1.78mm (Shrink-pitch) (S)

PART NUMBERING

(Please specify the part number when ordering.)

(Ex.) ARCL 10 S S 103J 102M –□
① ② ③ ④ ⑤ ⑥ ⑦

① Murata RC-Module (ARCL series) or ARC type
② Number of Pins
③ The type of circuit composition (F, G, L, S, X, Z = ARCL)
④ Lead Pitch (D, I = ARC)

Inch-pitch (2.54 mm)	Shrink-pitch (1.78 mm)
No marking	S

⑤ Resistance Value and Tolerance (10,000Ω)
⑥ Capacitance Value and Tolerance (1,000pF)
⑦ Special Specifications

(Please specify the part number when ordering.)

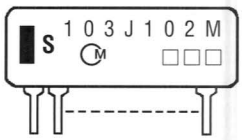
(Ex.) CNTL 6 Y W 102M –□
① ② ③ ④ ⑤ ⑥

① Murata C-Module. (CNTL series)
② Number of Pins.
③ The type of circuit composition. (X, Y)
④ Lead Pitch

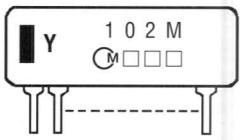
Inch-pitch	Shrink-pitch
W(2.54mm)	S(1.78mm)

⑤ Resistance Value and Tolerance 1,000Ω (102M)
⑥ Special Specifications

MARKING

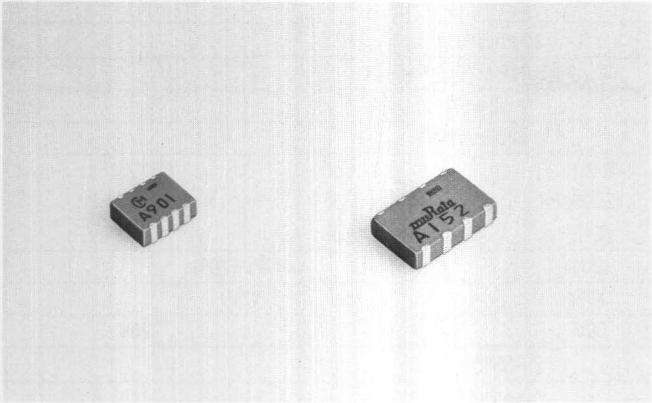


(Ex.)
1) Circuit Type·····S
2) Resistance Value and Tolerance, 10,000Ω (103J)
Capacitance Value and Tolerance·····1,000Ω (102M)
3) Manufacturer's symbol·····
4) Manufacturing lot No.·····□□□
5) Marking at pin one·····



(Ex.)
1) Circuit Type·····Y
2) Capacitance Value and Tolerance·····1,000pF (102M)
3) Manufacturer's symbol·····
4) Manufacturing lot No.·····□□□
5) Marking at pin one·····

DELAY LINE
CHIP MONOLITHIC, 200 MHz to 2 GHz



This delay line has been developed by applying chip multilayer and through hole technology. It consists of copper line and temperature compensated dielectric and incorporates metal shields. LD series are very small and provide excellent signal matching.

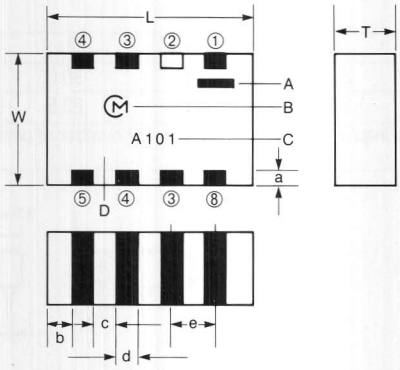
FEATURES

- **High stability at high frequency (200MHz to 2GHz).**
- **This product is small, thin, light and highly reliable and utilizes multilayer construction.**
- **Metal shield is built into the chip.**
- **Reflow soldering ability is standard.**
- **Supplied on tape & reel and bulk packaging.**

APPLICATIONS

- Optical interface equipment.
- Fiber optic tele-communications.
- High speed super computers.
- Test and measurement equipment.

DIMENSIONS : mm



CODE	LDH36	LDH46 TYP
L	6.3±0.3	10.0±0.3
W	5.0±0.3	6.3±0.3
T	2.5 max	4.0 max
a	0.4±0.3	0.4±0.3
b	0.64 min	0.49 min
c	0.3 min	1.3 min
d	0.6 min	0.8 min
e	1.27±0.2	2.54±0.2

TERMINAL

PIN No.	NAME	PIN No.	NAME
1	IN/OUT	5	IN/OUT
2	GND	6	GND
3	GND	7	GND
4	GND	8	GND

ELECTRICAL CHARACTER TABLE

Part Numbers	Delay Time (DT) (ns)	*Impedance	Rising Time	D.C. Resistance (Ω) MAX)	Insulation Resistance	Rated Power	Operating Temperature Range
LDH36 TYPE							
LDH36-01A101AB	0.1±0.05	50Ω±10%	0.1nS max.	0.2	100MΩ min	1/4W	−25 to +85°C
LDH36-01A201AB	0.2±0.05			0.4			
LDH36-01A301AB	0.3±0.05		0.15nS max	0.6			
LDH36-01A401AB	0.4±0.05			0.8			
LDH36-01A501AB	0.5±0.05			1.0			
LDH36-01A601BB	0.6±0.1			1.2			
LDH36-01A701BB	0.7±0.1		0.2nS max	1.4			
LDH36-01A801BB	0.8±0.1			1.6			
LDH36-01A901BB	0.9±0.1			1.8			
LDH36-01A102BB	1.0±0.1			2.0			
LDH46 TYPE							
LDH46-01A152BA	1.5±0.1	50Ω±10%	0.3nS max	3.0	100MΩ min	1/4W	−25 to +85°C
LDH46-01A202BA	2.0±0.1			4.0			
LDH46-01A252BA	2.5±0.1		0.4nS max	5.0			
LDH46-01A302BA	3.0±0.1			6.0			
LDH46-01A402BA	4.0±0.1			8.0			
LDH46-01A502BA	5.0±0.1			10.0			
LDH46-01A602CA	6.0±0.2		0.25 × DT max	12.0			
LDH46-01A702CA	7.0±0.2			14.0			
LDH46-01A802CA	8.0±0.2			16.0			
LDH46-01A902CA	9.0±0.2			18.0			
LDH46-01A103CA	10.0±0.2			20.0			

We offer custom design support and variations to above products.
Please contact our Circuit Module Group to discuss.

CAPACITORS— CHIP, MONOLITHIC

- Miniature size
- Wide capacitance, TC, voltage and tolerance range
- Industry standard sizes
- 8mm and 12mm tape and reel for auto-placements
- Barrier layer termination systems for wave, reflow or vapor phase solder
- Largest production volume and capacity in the industry

★ KIT-GRM36

Part No.	Cap.	Tol.
COG 50V, 100 each value		
GRM36COG0R5C50AB	0.5pF	± .25pF
GRM36COG010C50AB	1	± .25
GRM36COG020C50AB	2	± .25
GRM36COG030C50AB	3	± .25
GRM36COG040C50AB	4	± .25
GRM36COG050C50AB	5	± .25
GRM36COG060D50AB	6	± .5
GRM36COG070D50AB	7	± .5
GRM36COG080D50AB	8	± .5
GRM36COG090D50AB	9	± .5
GRM36COG100D50AB	10	± .5
GRM36COG120J50AB	12	±5 %
GRM36COG150J50AB	15	±5
GRM36COG180J50AB	18	±5
GRM36COG220J50AB	22	±5
GRM36COG270J50AB	27	±5
GRM36COG330J50AB	33	±5
GRM36COG390J50AB	39	±5
GRM36COG470J50AB	47	±5
GRM36COG560J50AB	56	±5
GRM36COG680J50AB	68	±5
GRM36COG820J50AB	82	±5
GRM36COG101J50AB	100	±5
GRM36COG121J50AB	120	±5
GRM36COG151J50AB	150	±5
X7R 50V, 200 each value		
GRM36X7R221K50AB	220 pF	±10%
GRM36X7R271K50AB	270	±10
GRM36X7R331K50AB	330	±10
GRM36X7R391K50AB	390	±10
GRM36X7R471K50AB	470	±10
GRM36X7R561K50AB	560	±10
GRM36X7R681K50AB	680	±10
GRM36X7R821K50AB	820	±10
GRM36X7R102K50AB	1000	±10
GRM36X7R122K50AB	1200	±10
GRM36X7R152K50AB	1500	±10
GRM36X7R182K50AB	1800	±10
GRM36X7R222K50AB	2200	±10
GRM36X7R272K50AB	2700	±10
GRM36X7R332K50AB	3300	±10
GRM36X7R392K50AB	3900	±10
GRM36X7R472K25AB	4700	±10
GRM36X7R562K25AB	5600	±10
GRM36X7R682K25AB	6800	±10
GRM36X7R822K16AB	8200	±10
GRM36X7R103K16AB	.01μF	±10
Y5V 50V, 200 each value		
GRM36Y5V102Z50AB	1000 pF	+80, −20%
GRM36Y5V222Z50AB	2200	+80, −20
GRM36Y5V332Z50AB	3300	+80, −20
GRM36Y5V472Z50AB	4700	+80, −20
GRM36Y5V103Z50AB	.01 μF	+80, −20
GRM36Y5V153Z25AB	.015	+80, −20
GRM36Y5V223Z25AB	.022	+80, −20
GRM36Y5V333Z16AB	.033	+80, −20

★ STANDARD DISTRIBUTOR ITEMS

★ KIT-GRM39

Part No.	Cap.	Tol.
COG 100V, 50 each value		
GRM39COG010B100AB	1 pF	± .1 pF
GRM39COG1R5B100AB	1.5	± .1
GRM39COG2R2B100AB	2.2	± .1
GRM39COG3R3B100AB	3.3	± .1
GRM39COG4R7B100AB	4.7	± .1
GRM39COG6R8C100AB	6.8	± .25
GRM39COG100D100AB	10	± .5
GRM39COG150J100AB	15	±5 %
GRM39COG220J100AB	22	±5
GRM39COG330J100AB	33	±5
GRM39COG470J100AB	47	±5
GRM39COG680J100AB	68	±5
GRM39COG101J100AB	100	±5
COG 50V, 50 each value		
GRM39COG010B050AB	1 pF	± .1 pF
GRM39COG1R5B050AB	1.5	± .1
GRM39COG2R2B050AB	2.2	± .1
GRM39COG3R3B050AB	3.3	± .1
GRM39COG4R7B050AB	4.7	± .1
GRM39COG6R8C050AB	6.8	± .25
GRM39COG100D050AB	10	± .5
GRM39COG150J050AB	15	±5 %
GRM39COG220J050AB	22	±5
GRM39COG330J050AB	33	±5
GRM39COG470J050AB	47	±5
GRM39COG680J050AB	68	±5
GRM39COG101J050AB	100	±5
GRM39COG151J050AB	150	±5
GRM39COG221J050AB	220	±5
X7R 50V, 50 each value		
GRM39X7R221K050AB	220pF	±10%
GRM39X7R331K050AB	330	±10
GRM39X7R471K050AB	470	±10
GRM39X7R681K050AB	680	±10
GRM39X7R102K050AB	1000	±10
GRM39X7R152K050AB	1500	±10
GRM39X7R222K050AB	2200	±10
GRM39X7R332K050AB	3300	±10
GRM39X7R472K050AB	4700	±10
GRM39X7R682K050AB	6800	±10
GRM39X7R103K050AB	.01μF	±10
X7R 25V, 50 each value		
GRM39X7R472K025AB	4700pF	±10%
GRM39X7R682K025AB	6200	±10
GRM39X7R103K025AB	.01μF	±10
X7R 16V, 50 each value		
GRM39X7R153K016AB	.015μF	±10%
GRM39X7R223K016AB	.022	±10
GRM39X7R333K016AB	.033	±10
Y5V 50V, 50 each value		
GRM39Y5V152Z050AB	1500pF	+80, −20%
GRM39Y5V222Z050AB	2200	+80, −20
GRM39Y5V332Z050AB	3300	+80, −20
GRM39Y5V472Z050AB	4700	+80, −20
GRM39Y5V682Z050AB	6800	+80, −20
GRM39Y5V103Z050AB	.01 μF	+80, −20%
GRM39Y5V153Z050AB	.015	+80, −20
GRM39Y5V223Z050AB	.022	+80, −20
Y5V 25V, 50 each value		
GRM39Y5V152Z025AB	1500pF	+80, −20%
GRM39Y5V222Z025AB	2200	+80, −20
GRM39Y5V332Z025AB	3300	+80, −20
GRM39Y5V472Z025AB	4700	+80, −20
GRM39Y5V682Z025AB	6800	+80, −20
GRM39Y5V103Z025AB	.01 μF	+80, −20
GRM39Y5V153Z025AB	.015	+80, −20
GRM39Y5V223Z025AB	.022	+80, −20
GRM39Y5V333Z025AB	.033	+80, −20
GRM39Y5V473Z025AB	.047	+80, −20
Y5V 16V, 50 each value		
GRM39Y5V333Z016AB	.033μF	+80, −20%
GRM39Y5V473Z016AB	.047	+80, −20
GRM39Y5V683Z016AB	.068	+80, −20
GRM39Y5V104Z016AB	.1	+80, −20

CAPACITORS— CHIP, MONOLITHIC (continued)

★KIT-GRM40

Part No.	Cap.	Tol.
COG 50V, 50 each value		
GRM40COG010C050AB	1pF	± .25pF
GRM40COG020C050AB	2	± .25
GRM40COG030C050AB	3	± .25
GRM40COG040C050AB	4	± .25
GRM40COG050D050AB	5	± .5
GRM40COG060D050AB	6	± .5
GRM40COG070D050AB	7	± .5
GRM40COG080D050AB	8	± .5
GRM40COG090D050AB	9	± .5
GRM40COG100D050AB	10	± .5
GRM40COG120J050AB	12	±5 %
GRM40COG150J050AB	15	±5
GRM40COG180J050AB	18	±5
GRM40COG220J050AB	22	±5
GRM40COG330J050AB	33	±5
GRM40COG390J050AB	39	±5
GRM40COG470J050AB	47	±5
GRM40COG560J050AB	56	±5
GRM40COG680J050AB	68	±5
GRM40COG820J050AB	82	±5
GRM40COG101J050AB	100	±5
GRM40COG121J050AB	120	±5
GRM40COG151J050AB	150	±5
GRM40COG181J050AB	180	±5
GRM40COG221J050AB	220	±5
GRM40COG271J050AB	270	±5
GRM40COG331J050AB	330	±5
GRM40COG391J050AB	390	±5
GRM40COG471J050AB	470	±5
X7R 50V, 100 each value		
GRM40X7R391K050AB	390pF	±10%
GRM40X7R471K050AB	470	±10
GRM40X7R561K050AB	560	±10
GRM40X7R681K050AB	680	±10
GRM40X7R821K050AB	820	±10
GRM40X7R102K050AB	1000	±10
GRM40X7R122K050AB	1200	±10
GRM40X7R152K050AB	1500	±10
GRM40X7R182K050AB	1800	±10
GRM40X7R222K050AB	2200	±10
GRM40X7R272K050AB	2700	±10
GRM40X7R332K050AB	3300	±10
GRM40X7R392K050AB	3900	±10
GRM40X7R472K050AB	4700	±10
GRM40X7R562K050AB	5600	±10
GRM40X7R682K050AB	6800	±10
GRM40X7R822K050AB	8200	±10
GRM40X7R103K050AB	.01 μF	±10
GRM40X7R123K050AB	.012	±10
GRM40X7R153K050AB	.015	±10
GRM40X7R183K050AB	.018	±10
GRM40X7R223K050AB	.022	±10
Z5U 50V, 100 each value		
GRM40Z5U103M050AB	.01 μF	±20%
GRM40Z5U123M050AB	.012	±20
GRM40Z5U183M050AB	.018	±20
GRM40Z5U223M050AB	.022	±20
GRM40Z5U333M050AB	.033	±20
GRM40Z5U473M050AB	.047	±20
Y5V, 25V, 100 each value		
GRM40Y5V104Z25V	.1 μF	+80, −20%

★ STANDARD DISTRIBUTOR ITEMS

★KIT-GRM42-6

Part No.	Cap.	Tol.
COG 50V, 50 each value		
GRM42-6COG100D050AB	10pF	± .5pF
GRM42-6COG120J050AB	12	±5 %
GRM42-6COG150J050AB	15	±5
GRM42-6COG180J050AB	18	±5
GRM42-6COG220J050AB	22	±5
GRM42-6COG330J050AB	33	±5
GRM42-6COG390J050AB	39	±5
GRM42-6COG470J050AB	47	±5
GRM42-6COG560J050AB	56	±5
GRM42-6COG680J050AB	68	±5
GRM42-6COG820J050AB	82	±5
GRM42-6COG101J050AB	100	±5
GRM42-6COG121J050AB	120	±5
GRM42-6COG151J050AB	150	±5
GRM42-6COG181J050AB	180	±5
GRM42-6COG221J050AB	220	±5
GRM42-6COG271J050AB	270	±5
GRM42-6COG331J050AB	330	±5
GRM42-6COG391J050AB	390	±5
GRM42-6COG471J050AB	470	±5
GRM42-6COG561J050AB	560	±5
GRM42-6COG681J050AB	680	±5
GRM42-6COG821J050AB	820	±5
GRM42-6COG102J050AB	1000	±5
X7R 50V, 100 each value		
GRM42-6X7R331K050AB	330pF	±10%
GRM42-6X7R391K050AB	390	±10
GRM42-6X7R471K050AB	470	±10
GRM42-6X7R561K050AB	560	±10
GRM42-6X7R681K050AB	680	±10
GRM42-6X7R821K050AB	820	±10
GRM42-6X7R102K050AB	1000	±10
GRM42-6X7R122K050AB	1200	±10
GRM42-6X7R152K050AB	1500	±10
GRM42-6X7R182K050AB	1800	±10
GRM42-6X7R222K050AB	2200	±10
GRM42-6X7R272K050AB	2700	±10
GRM42-6X7R332K050AB	3300	±10
GRM42-6X7R392K050AB	3900	±10
GRM42-6X7R472K050AB	4700	±10
GRM42-6X7R562K050AB	5600	±10
GRM42-6X7R682K050AB	6800	±10
GRM42-6X7R822K050AB	8200	±10
GRM42-6X7R103K050AB	.01 μF	±10
GRM42-6X7R123K050AB	.012	±10
GRM42-6X7R153K050AB	.015	±10
GRM42-6X7R183K050AB	.018	±10
GRM42-6X7R223K050AB	.022	±10
GRM42-6X7R273K050AB	.027	±10
GRM42-6X7R333K050AB	.033	±10
GRM42-6X7R393K050AB	.039	±10
GRM42-6X7R473K050AB	.047	±10
GRM42-6X7R563K050AB	.056	±10
GRM42-6X7R683K050AB	.068	±10
GRM42-6X7R823K050AB	.082	±10
GRM42-6X7R104K050AB	.1	±10
Z5U 50V, 100 each value		
GRM42-6Z5U473M050AB	.047μF	±20%
GRM42-6Z5U563M050AB	.056	±20
GRM42-6Z5U683M050AB	.068	±20
GRM42-6Z5U823M050AB	.082	±20
GRM42-6Z5U104M050AB	.1	±20

muRata

CAPACITORS— CHIP, MONOLITHIC (continued)

KIT-GRM40-TC
Temperature compensating
Values below in each of these T.C.'s: P2H, R2H, S2H, T2H, U2J

Part No.	Cap.	Tol.
50V, 50 each value		
GRM40□□□010B050AB	1 pF	± .1 pF
GRM40□□□1R5B050AB	1.5	± .1
GRM40□□□2R2B050AB	2.2	± .1
GRM40□□□3R3B050AB	3.3	± .1
GRM40□□□4R7B050AB	4.7	± .1
GRM40□□□6R8C050AB	6.8	± .25
GRM40□□□100D050AB	10	± .5
GRM40□□□150J050AB	15	±5 %
GRM40□□□220J050AB	22	±5
GRM40□□□330J050AB	33	±5
GRM40□□□470J050AB	47	±5
GRM40□□□680J050AB	68	±5
GRM40□□□101J050AB	100	±5
GRM40□□□151J050AB	150	±5
GRM40□□□221J050AB	220	±5
GRM40□□□331J050AB	330	±5
GRM40□□□471J050AB	470	±5
GRM40□□□681J050AB	680	±5
GRM40□□□102J050AB	1000*	±5
GRM40□□□152J050AB	1500*	±5

*T2H and U2J only

KIT-GRM42-6-TC
Temperature compensating
Values below in each of these T.C.'s: P2H, R2H, S2H, T2H, U2J

Part No.	Cap.	Tol.
50V, 50 each value		
GRM42-6□□□010B050AB	1 pF	± .1 pF
GRM42-6□□□1R5B050AB	1.5	± .1
GRM42-6□□□2R2B050AB	2.2	± .1
GRM42-6□□□3R3B050AB	3.3	± .1
GRM42-6□□□4R7B050AB	4.7	± .1
GRM42-6□□□6R8C050AB	6.8	± .25
GRM42-6□□□100D050AB	10	± .5
GRM42-6□□□150J050AB	15	±5 %
GRM42-6□□□220J050AB	22	±5
GRM42-6□□□330J050AB	33	±5
GRM42-6□□□470J050AB	47	±5
GRM42-6□□□680J050AB	68	±5
GRM42-6□□□101J050AB	100	±5
GRM42-6□□□151J050AB	150	±5
GRM42-6□□□221J050AB	220	±5
GRM42-6□□□331J050AB	330	±5
GRM42-6□□□471J050AB	470	±5
GRM42-6□□□681J050AB	680	±5
GRM42-6□□□102J050AB	1000*	±5
GRM42-6□□□152J050AB	1500*	±5

*T2H and U2J only

★ STANDARD DISTRIBUTOR ITEMS

CAPACITORS— CHIP, MONOLITHIC, ELECTROLYTICS REPLACEMENTS

KIT-GRM-TA
Tantalum Alternative

Part No.	Cap.	Tol.
X7R 16V, 25 each value, *10 each value		
GRM39X7R153K016AB	.015μF	±10%
GRM39X7R223K016AB	.022	±10
GRM39X7R333K016AB	.033	±10
GRM40X7R153K016AB	.015	±10
GRM40X7R223K016AB	.022	±10
GRM40X7R333K016AB	.033	±10
GRM40X7R473K016AB	.047	±10
GRM40X7R683K016AB	.068	±10
GRM40X7R104K016AB	.1	±10
GRM40X7R154K016AB	.15	±10
GRM42-6X7R104K016AB	.1	±10
GRM42-6X7R154K016AB	.15	±10
GRM42-6X7R224K016AB	.22	±10
GRM42-6X7R334K016AB	.33	±10
*GRM42-2X7R154K016AB	.15	±10
*GRM42-2X7R224K016AB	.22	±10
*GRM42-2X7R334K016AB	.33	±10
*GRM42-2X7R474K016AB	.47	±10
*GRM43-2X7R474K016AB	.47	±10
Y5V 16V, 25 each value, *10 each value		
GRM39Y5V333Z016AB	.033μF	+80, −20%
GRM39Y5V473Z016AB	.047	+80, −20
GRM39Y5V683Z016AB	.068	+80, −20
GRM39Y5V104Z016AB	.1	+80, −20
GRM40Y5V333Z016AB	.033	+80, −20
GRM40Y5V473Z016AB	.047	+80, −20
GRM40Y5V683Z016AB	.068	+80, −20
GRM40Y5V104Z016AB	.1	+80, −20
GRM40Y5V154Z016AB	.15	+80, −20
GRM40Y5V224Z016AB	.22	+80, −20
GRM40Y5V334Z016AB	.33	+80, −20
GRM40Y5V474Z016AB	.47	+80, −20
GRM42-6Y5V154Z016AB	.15	+80, −20
GRM42-6Y5V224Z016AB	.22	+80, −20
GRM42-6Y5V334Z016AB	.33	+80, −20
GRM42-6Y5V474Z016AB	.47	+80, −20
GRM42-6Y5V684Z016AB	.68	+80, −20
GRM42-6Y5V105Z016AB	1.0	+80, −20
GRM42-6Y5V155Z016AB	1.5	+80, −20
*GRM42-2Y5V684Z016AB	.68	+80, −20
*GRM42-2Y5V105Z016AB	1.0	+80, −20
*GRM42-2Y5V155Z016AB	1.5	+80, −20
*GRM42-2Y5V225Z016AB	2.2	+80, −20
*GRM43-2Y5V225Z016AB	2.2	+80, −20

CAPACITORS— CHIP MONOLITHIC, MICROWAVE

- Miniature sizes
- Very high Q at high frequencies
- High RF power capabilities
- Impervious to adverse environmental conditions
- Low dissipation factors
- Perfect retrace capability
- High temperature stability
- Low noise

★ KIT-MA18-001
(Evaluation Kit)

Part No.	Cap.	Tol.
P90 150V, 5 each value		
MA181R0B	1.0pF	± .1 pF
MA181R8C	1.8	± .25
MA182R7D	2.7	± .5
MA183R3D	3.3	± .5
MA184R7D	4.7	± .5
MA185R7D	5.6	± .5
MA188R2K	8.2	± 10 %
MA18100K	10	± 10
MA18120K	12	± 10
MA18150K	15	± 10
MA18220K	22	± 10
MA18360K	36	± 10
MA18470K	47	± 10
MA18560K	56	± 10
MA18820K	82	± 10

★ KIT-MA18-002
(Tune Kit)

Part No.	Cap.	Tol.
P90 150V, 5 each value		
MA180R3B	0.3pF	± .1 pF
MA180R4B	0.4	± .1
MA180R5B	0.5	± .1
MA180R6B	0.6	± .1
MA180R7B	0.7	± .1
MA180R8B	0.8	± .1
MA180R9B	0.9	± .1
MA181R0B	1.0	± .1
MA181R2B	1.2	± .1
MA181R4B	1.4	± .1
MA181R5B	1.5	± .1
MA181R6B	1.6	± .1
MA181R8B	1.8	± .1
MA181R9B	1.9	± .1
MA182R0B	2.0	± .1
MA182R1B	2.1	± .1
MA182R2B	2.2	± .1
MA182R4B	2.4	± .1
MA182R7B	2.7	± .1
MA183R0B	3.0	± .1
MA183R6C	3.6	± .25
MA183R9C	3.9	± .25
MA184R7C	4.7	± .25
MA185R1C	5.1	± .25
MA185R6C	5.6	± .25
MA186R2C	6.2	± .25
MA186R8J	6.8	± 5 %
MA188R2J	8.2	± 5
MA189R1J	9.1	± 5
MA18100J	10	± 5

★ STANDARD DISTRIBUTOR ITEMS

★ KIT-MA18-003
(Designer Kit)

Part No.	Cap.	Tol.
P90 150V, 5 each value		
MA181R0B	1.0pF	± .1 pF
MA181R3B	1.3	± .1
MA181R6B	1.6	± .1
MA181R9B	1.9	± .1
MA182R1B	2.1	± .1
MA182R7C	2.7	± .25
MA183R3C	3.3	± .25
MA183R9C	3.9	± .25
MA184R7C	4.7	± .25
MA185R6C	5.6	± .25
MA186R8J	6.8	± 5 %
MA187R5J	7.5	± 5
MA188R5J	8.2	± 5
MA189R1J	9.1	± 5
MA18100J	10	± 5
MA18120J	12	± 5
MA18150J	15	± 5
MA18180J	18	± 5
MA18220J	22	± 5
MA18240J	24	± 5
MA18270J	27	± 5
MA18330J	33	± 5
MA18360J	36	± 5
MA18390J	39	± 5
MA18470J	47	± 5
MA18560J	56	± 5
MA18680K	68	± 10
MA18750K	75	± 10
MA18820K	82	± 10
MA18910K	91	± 10

★ KIT-MA28-001 (1)
(Evaluation Kit)

Part No.	Cap.	Tol.
P90 500V, 5 each value		
MA281R0C	1.0pF	± .25pF
MA282R2D	2.2	± .5
MA283R6D	3.6	± .5
MA285R6D	5.6	± .5
MA287R5D	7.5	± .5
MA28110J	11	± 5 %
MA28160J	16	± 5
MA28240J	24	± 5
MA28360J	36	± 5
MA28510J	51	± 5
MA28750J	75	± 5
MA28101J	100	± 5
MA28201J	200*	± 5
MA28471M	470*	± 20
MA28621M	620**	± 20

*300VDC **200VDC

★ KIT-MA28-002 (1)
(Tune Kit)

Part No.	Cap.	Tol.
P90 500V, 5 each value		
MA280R3B	0.3pF	± .1pF
MA280R4B	0.4	± .1
MA280R5B	0.5	± .1
MA280R6B	0.6	± .1
MA280R7B	0.7	± .1
MA280R8B	0.8	± .1
MA280R9B	0.9	± .1
MA281R0B	1.0	± .1
MA281R2B	1.2	± .1
MA281R4B	1.4	± .1

CAPACITORS— CHIP MONOLITHIC, MICROWAVE (continued)

KIT-MA28-002 (1) (continued)
(Tune Kit)

Part No.	Cap.	Tol.
P90 500V, 5 each value (continued)		
MA281R5B	1.5pF	± .1 pF
MA281R6B	1.6	± .1
MA281R8B	1.8	± .1
MA281R9B	1.9	± .1
MA282R0B	2.0	± .1
MA282R1B	2.1	± .1
MA282R2B	2.2	± .1
MA282R4B	2.4	± .1
MA282R7B	2.7	± .1
MA283R0B	3.0	± .1
MA283R6C	3.6	± .25
MA283R9C	3.9	± .25
MA284R7C	4.7	± .25
MA285R1C	5.1	± .25
MA285R6C	5.6	± .25
MA286R2C	6.2	± .25
MA286R8J	6.8	±5 %
MA288R2J	8.2	±5
MA289R1J	9.1	±5
MA28100J	10	±5

KIT-MA28-003 (1)
(Designer Kit)

Part No.	Cap.	Tol.
P90 500V, 5 each value		
MA280R3B	0.3pF	± .1 pF
MA280R4B	0.4	± .1
MA280R5B	0.5	± .1
MA280R6B	0.6	± .1
MA280R7B	0.7	± .1
MA280R8B	0.8	± .1
MA280R9B	0.9	± .1
MA281R2B	1.2	± .1
MA281R5C	1.5	± .25
MA281R8C	1.8	± .25
MA282R2C	2.2	± .25
MA282R7C	2.7	± .25
MA283R0C	3.0	± .25
MA283R3C	3.3	± .25
MA283R6C	3.6	± .25
MA284R3C	4.3	± .25
MA285R6C	5.6	± .25
MA286R2C	6.2	± .25
MA286R8J	6.8	± 5 %
MA287R5J	7.5	± 5
MA288R2J	8.2	± 5
MA289R1J	9.1	± 5
MA28100J	10	± 5
MA28110J	11	± 5
MA28130J	13	± 5
MA28160J	16	± 5
MA28180J	18	± 5
MA28240J	24	± 5
MA28270J	27	± 5
MA28300J	30	± 5
MA28330J	33	± 5
MA28360J	36	± 5
MA28430J	43	± 5
MA28470J	47	± 5
MA28560K	56	±10
MA28620K	62	±10
MA28680K	68	±10
MA28910K	91	±10
MA28131K	130*	±10
MA28161K	160*	±10

★ STANDARD DISTRIBUTOR ITEMS

★ KIT-MA28-003 (1)
★ KIT-MA22-003MS (2)
(Designer Kit)

Part No.	Cap.	Tol.
P90 150V, 5 each value		
MA28181K	180*pF	±10%
MA28201K	200**	±10
MA28221K	220**	±10
MA28241K	240**	±10
MA28301K	300**	±10
MA28361M	360**	±20
MA28431M	430**	±20
MA28471M	470**	±20
MA28511M	510**	±20
MA28561M	560**	±20
MA28621M	620**	±20

*300VDC **200VDC

(1) Termination-Palladium silver, nickel interface, solder (SN62)
(2) Termination-Microstrip leads

CAPACITORS— RADIAL LEADED, MONOLITHIC

- Wide capacitance, T.C., voltage and tolerance range
- Industry standard sizes
- Tape and Reel available for auto insertion
- Various lead spacing available
- Marking standard or to customer specification

★ KIT-RPE

Part No.	Cap.	Tol.
COG 100V, 50 each value		
RPE110COG1R0C100V	1 pF	± .25pF
RPE110COG2R2C100V	2.2	± .25
RPE110COG4R7C100V	4.7	± .25
RPE110COG8R2D100V	8.2	± .25
RPE110COG100D100V	10	±5 %
RPE110COG180J100V	18	±5
RPE110COG220J100V	22	±5
RPE110COG330J100V	33	±5
RPE110COG470J100V	47	±5
RPE110COG680J100V	68	±5
RPE110COG820J100V	82	±5
RPE122COG101J100V	100	±5
RPE122COG221J100V	220	±5
RPE122COG331J100V	330	±5
RPE122COG471J100V	470	±5
RPE122COG821J100V	820	±5
X7R 100V, 50 each value		
RPE122X7R102K100V	1,000pF	±10%
RPE122X7R222K100V	2,200	±10
RPE122X7R472K100V	4,700	±10
RPE122X7R103K100V	10,000	±10
RPE122X7R223K100V	22,000	±10
RPE122X7R333K100V	33,000	±10
RPE122X7R473K100V	47,000	±10
RPE122X7R104K100V	100,000	±10
Z5U 50V, 50 each value		
RPE122Z5U224M050V	220,000pF	±20%
RPE122Z5U334M050V	330,000	±20
RPE123Z5U474M050V	470,000	±20
RPE123Z5U105M050V	1,000,000	±20

CAPACITORS— RADIAL LEADED, MONOLITHIC *(continued)*

★KIT-RPE-TR*

Part No.	Cap.	Tol.
COG 100V, 50 each value		
RPE122COG1R0C100V	1pF	± .25pF
RPE122COG2R2C100V	2.2	± .25
RPE122COG4R7C100V	4.7	± .25
RPE122COG8R2D100V	8.2	± .25
RPE122COG100D100V	10	±5%
RPE122COG180J100V	18	±5
RPE122COG220J100V	22	±5
RPE122COG330J100V	33	±5
RPE122COG470J100V	47	±5
RPE122COG680J100V	68	±5
RPE122COG820J100V	82	±5
RPE122COG101J100V	100	±5
RPE122COG221J100V	220	±5
RPE122COG331J100V	330	±5
RPE122COG471J100V	470	±5
RPE122COG821J100V	820	±5
X7R 100V, 50 each value		
RPE122X7R102K100V	1,000pF	±10%
RPE122X7R222K100V	2,200	±10
RPE122X7R472K100V	4,700	±10
RPE122X7R103K100V	10,000	±10
RPE122X7R223K100V	22,000	±10
RPE122X7R333K100V	33,000	±10
RPE122X7R473K100V	47,000	±10
RPE122X7R104K100V	100,000	±10
Z5U 100V, 50 each value		
RPE122Z5U103M100V	10,000pF	±20%
RPE122Z5U104M100V	100,000	±20
Z5U 50V, 50 each value		
RPE122Z5U224M050V	220,000pF	±20%
RPE122Z5U334M050V	330,000	±20
RPE123Z5U474M050V	470,000	±20
RPE123Z5U105M050V	1,000,000	±20

*Supplied with typical Tape & Reel lead forms.

CAPACITORS— HIGH VOLTAGE

- Expoxy resin encapsulated
- Small Size
- High reliable internal construction
- Wide selection of values
- Up to 40 KVDC working voltage

★KIT-HIGH VOLTAGE

Part No.	Cap.	KV	Tol.	Qty.
DHR12Y5P471M7.5KV	470pF	7.5	±20%	25
DHR15Y5P120M7.5KV	1,000	7.5	±20	25
DHR17Y5P102M10KV	1,000	10	±20	25
DHR9Y5P101M15KV	100	15	±20	25
DHR15Y5P471M15KV	470	15	±20	25
DHR20Y5P102M15KV	1,000	15	±20	25
DHS30N4700122M10KV	1,200	10	±20	5
DHS38N4700192M15KV	1,900	15	±20	5
DHS24Z5V461Z30KV	460	30	+80, –20	5
DHS30N4700591M30KV	590	30	±20	5
DHS60Z5V272Z40KV	2,700	40	+80, –20	5
DCC510N750101K	100	7.5	±10	1
DCC507N750101K	100	15	±10	1

★STANDARD DISTRIBUTOR ITEMS

CAPACITORS— DISC, SAFETY

★KIT-SAFETY-CAPACITOR

- Meet UL, CSA, SEV, VDE, etc. standards

Part No.	Cap.	Tol.
400, 250, 125VAC 25 each value		
DE7090B101KVA1-KC	100pF	± 10%
DE7090B151KVA1-KC	150	± 10
DE7090B221KVA1-KC	220	± 10
DE7090B331KVA1-KC	330	± 10
DE7090B471KVA1-KC	470	± 10
DE7090B102KVA1-KC	1,000	± 10
DE7100F222MVA1-KC	2,200	± 20
DE7120F332MVA1-KC	3,300	± 20
DE7150F472MVA1-KC	4,700	± 20
DE7100FZ472PVA1-KC	4,700	+100, –0
DE7150F103MVA1-KC	10,000	± 20
DE7150FZ103PVA1-KC	10,000	+100, –0
DE2110F682MAC125-MX	6,800	± 20
DE1910E472MACT4K-KD	4,700	± 20
DE1410E222MACT4K-KD	2,200	± 20

CAPACITORS— CHIP TRIMMING

- Miniature Size
- Designed for auto-placement
- Can be immersed in flux and solder bath
- Can be cleaned with organic solvents

★KIT-TZSBOX-1

Part No.	Min. Cap.	Max. Cap.	T.C.
TZ03, 8 each value			
TZ03Z2R3FR169	1.25pF	2.3pF	COG
TZ03Z050FR169	1.8	5.0	COG
TZ03Z070FR169	2.0	7.0	COG
TZ03Z100FR169	2.7	10.0	COG
TZ03N100FR169	2.1	10.0	N220
TZ03T110FR169	3.0	11.0	N450
TZ03T200FR169	4.2	20.0	N450
TZ03R200FR169	4.2	20	N750
TZ03R300FR169	5.2	30	N750
TZ03P450FR169	6.8	45	N1200
TZ03P600FR169	9.8	60	N1200
TZ03Z500FR169	6	50	COG
TZ03R900FR169	9	90	N750
TZBX4, 10 each value			
TZBX4Z030BC110	1.4pF	3.0pF	COG
TZBX4Z060BC110	2.0	6.0	COG
TZBX4N100BC110	3.0	10.0	N150
TZBX4R200BC110	4.5	20.0	N750
TZBX4P300BC110	6.5	30.0	N1200
TZBX4P400BC110	9.0	40.0	N1200
TZBX4Z250BC110	4.0	25.0	COG
TZBX4R500BC110	7.0	50.0	N750

CAPACITORS— CHIP TRIMMING *(continued)*

KIT-TZSBOX-2

Part No.	Min. Cap.	Max. Cap.	T.C.
TZBX4, 10 each value			
TZBX4Z030BA110	1.4pF	3.0pF	COG
TZBX4Z060BA110	2.0	6.0	COG
TZBX4N100BA110	3.0	10.0	N150
TZBX4R200BA110	4.5	20.0	N750
TZBX4P300BA110	6.5	30.0	N1200
TZBX4P400BA110	9.0	40.0	N1200
TZBX4Z250BA110	4.0	25.0	COG
TZBX4R500BA110	7.0	50.0	N750
TZBX4Z060BB110	2.0	6.0	COG
TZBX4N100BB110	3.0	10.0	N150
TZBX4R200BB110	4.5pF	20.0pF	N750
TZBX4P300BB110	6.5	30.0	N1200
TZBX4Z060BE110	2.0	6.0	COG
TZBX4N100BE110	3.0	10.0	N150
TZBX4R200BE110	4.5	20.0	N750
TZBX4P400BE110	9.0	40.0	N1200
TZC03, 10 each value			
TZC03Z030A110	1.4	3.0	COG
TZC03Z060A110	2.0pF	6.0pF	COG
TZC03R100A110	3.0	10.0	N750
TZC03P200A110	5.0	20.0	N1200
TZC03P300A110	6.5	30.0	N1200

KIT-TZSBOX-3

Part No.	Min. Cap.	Max. Cap.	T.C.
TZBX4, 10 each value			
TZBX4Z030BA110	1.4pF	3.0pF	COG
TZBX4Z060BA110	2.0	6.0	COG
TZBX4N100BA110	3.0	10.0	N150
TZBX4R200BA110	4.5	20.0	N750
TZBX4P300BA110	6.5	30.0	N1200
TZBX4P400BA110	9.0	40.0	N1200
TZBX4Z250BA110	4.0	25.0	COG
TZBX4R500BA110	7.0	50.0	N750
TZBX4R200BB110	4.5	20.0	N750
TZBX4P300BB110	6.5	30.0	N1200
TZBX4Z060BB110	2.0	6.0	COG
TZBX4N100BB110	3.0	10.0	N150
TZBX4R200BC110	4.5	20.0	N750
TZBX4Z060BD110	2.0	6.0	COG
TZBX4N100BD110	3.0	10.0	N150
TZBX4R200BD110	4.5	20.0	N750
TZBX4Z060BE110	2.0	6.0	COG
TZBX4N100BE110	3.0	10.0	N150
TZBX4R200BE110	4.5	20.0	N750
TZBX4Z060BB110	2.0	6.0	COG
TZBX4N100BB110	3.0	10.0	N150

★KIT-TZSBOX-4

Part No.	Min. Cap.	Max. Cap.	T.C.
TZ03, 8 each value			
TZ03Z070FR169	2.0pF	7.0pF	COG
TZ03Z100FR169	2.7	10.0	COG
TZ03T110FR169	3.0	11.0	N450
TZ03T200FR169	4.2	20.0	N450
TZ03R200FR169	4.2	20.0	N750
TZ03R300FR169	5.2	30.0	N750
TZ03P450FR169	6.8	45.0	N1200
TZ03Z500FR169	6.0	50.0	COG
TZBX4, 10 each value			
TZBX4Z030BA110	1.4pF	3.0pF	COG
TZBX4Z060BA110	2.0	6.0	COG
TZBX4N100BA110	3.0	10.0	N150
TZBX4R200BA110	4.5	20.0	N750
TZBX4P300BA110	6.5	30.0	N1200
TZBX4P400BA110	9.0	40.0	N1200
TZBX4Z250BA110	4.0	25.0	COG
TZBX4R500BA110	7.0	50	N750
TZC03, 10 each value			
TZC03Z030A110			
TZC03Z060A110	2.0pF	6.0pF	COG
TZC03P100A110	3.0	10.0	N750
TZC03P200A110	5.0	20.0	N1200
TZC03P300A110			

★STANDARD DISTRIBUTOR ITEMS

EMI/RFI FILTERS— POWERLINE

- For AC power line filtering
- Small size
- Wide selection of attenuation characteristics

★KIT-EK025B

Part No.	Qty.	Type
PLAA1022R0R01B1	2	Compact Common Mode Choke Coil, Non-Case Type
PLAA3021R0R01B1	2	
PLAA5020R6R01B1	2	
PLAC8020R5R01B1	2	Case-Type
PLH11A6003R3P01B1	2	High Frequency Common Mode Choke Coil
PLH11A1511R5P01B1	2	
PLE25H-1531R	1	Common Mode Choke Coil
PLE25H-2023R	1	
PLC20A3031R0D01B1	1	
PLC20B7030R5D01B1	1	
DSR1100-56E222M VA2-EA	10	Safety Standard Recognized EMIFIL® For AC Power Supplies
DSR1120-56 E302M VA2-EA	10	
DSR1150-56 E472M VA2-EA	10	Safety Standard Recognized EMIFIL® For AC Power Supplies
DSR1100-56 FZ472P VA2-EA	10	
PLI-A0302	1	Noise Filter For AC Line Applications
PLI-C1030	1	
PLI-D0303	1	
PLI-E0303	1	
PLI-S0303	1	
PLF-C1030	1	
PLT1R53C	5	Common Mode Choke Coil
BNX002-01	5	DC Power Line Filter
BL02RN2-R62	50	Ferrite Bead

★STANDARD DISTRIBUTOR ITEMS

EMI/RFI FILTERS— COMPUTING DEVICES

- For PCB application
- For DC signal line filtering
- Wide selection of values

★KIT-EK015C

Part No.		Qty.	Type
BNX002-01		3	DC Powerline Filter
BNP002-03		3	Signal Line Filter
DF221-601SS152GMV50		30	Subminiature Semiconductor
BL01RN1-A62		50	Ferrite Bead Inductors
BL02RN2-R62		50	
BL03RN2-R62		50	
BLM31A02		20	Chip Ferrite Bead
BLM41A04		20	
DS306-55Y5S470M	50V	20	3 Lead Disc Filter
DS306-55Y5S101M	50V	20	
DS306-55Y5S271M	50V	20	
DS306-55Y5S102M	50V	20	
DS306-55Y5S222M	50V	20	
DS306-55FZ103Z	50V	20	
DSS306-55Y5S220M	100V	50	3 Lead Disc Filter With Ferrites
DSS306-55Y5S470M	100V	50	
DSS306-55Y5S101M	100V	50	
DSS306-55Y5S221M	100V	50	
DSS306-55Y5S471M	100V	50	3 Lead Disc Filter With Ferrites
DSS306-55Y5S102M	100V	50	
DSS306-55Y5U222Z	100V	50	
DSS306-55FZ103N	100V	50	
DSS306-55FZ223Z	16V	50	
DS310-55Y5S223S	50V	20	3 Lead Disc Filter
DS310-55Y5S104M	16V	20	
DSS310-55Y5S2220M	100V	20	3 Lead Disc Filter With Ferrites
DSS310-55Y5S470M	100V	20	
DSS310-55Y5S101M	100V	20	
DSS310-55Y5S271M	100V	20	
DSS310-55Y5S222M	100V	20	
DSS310-55Y5S223S	100V	20	
DSS710-D223S12-22		5	Varistor/Capacitor
NFV610-655T2A106	100V	5	Noise Suppression Filter
NFV610-655T2A206	100V	5	
NFV610-655T2A506	100V	5	
NFV610-655T2A107	100V	5	

EMI/RFI FILTERS— LEADED PCB FILTERS

- PCB application
- Various applications
- Wide selection of values available
- AC/DC applications
- Leaded devices

★KIT-EK055A

Part No.		Qty.	Type
BLO1RN1-A62		30	Ferrite Bead Inductor
BLO2RN2-R62		30	
DSS306-55Y5S470M100	100VDC	20	Disc Type EMI/FIL
Y5S101M100	100VDC	20	
Y5S471M100	100VDC	20	
Y5S102M100	100VDC	20	
Y5U222Z100	100VDC	20	
FZ 103N100	100VDC	20	
F 223Z16	16VDC	20	
DSS710D223S12-22	12VDC	10	3Terminal Varistor-Capacitor
VFR303-351AZ25	25VDC	10	EMI GUARD for Semiconductor Protect Function

★KIT-EK055A *(continued)*

Part No.		Qty.	Type
BNX002-01	50VDC	5	Broad Band Power Supply Filter
BNP002-02	50VDC	5	Block Type Filter
NFV510-655T2A106	100VDC	6	Signal Line Noise Filter
206	100VDC	6	
506	100VDC	6	
107	100VDC	6	
NFV610-655T2A106	100VDC	6	
206	100VDC	6	
506	100VDC	6	
107	100VDC	6	
DVZ10-551A221	140VAC	10	ZnO Surge Absorber
	180VDC		
431	275VAC	10	
	350VDC		
DSR1100-56E222MVA2-EA*		10	AC Three Terminal Capacitor
DSR1150-56E472MVA2-EA*		10	
PLH20H-9021R0	250VAC	2	Common Mode Choke Coil
-2523R0	250VAC	2	
-8016R0	250VAC	2	
PLH14H-4020R5	250VAC	2	
-2420R8	250VAC	2	
-4013R0	250VAC	2	
PLH11A1811R2P01B1	250VAC	2	
1511R5P01B1	250VAC	2	
6003R3P01B1	250VAC	2	
PLAA3030R3D01B1	250VAC	2	
7020R7D01B1	250VAC	2	
1022R0RR1B1	250VAC	2	

*VDE, SEMKO, BS: 250VAC UL, CSA : 125VAC

★STANDARD DISTRIBUTOR ITEMS

EMI/RFI FILTERS— SURFACE MOUNT FILTERS

- For surface mount applications
- Extremely small size
- For DC and sequel applications

KIT-EK115B

Part No.	Qty.	Product Type
BLM11A12	100	Chip Ferrite Bead
BLM21A05	100	
BLM21A10	100	
BLM21B03	20	
BLM32A06	40	
BLM41A01	40	
BLM550A	10	
BLA81B01	5	Ferrite Bead Array
BLA62B01	5	
BLA41B01	5	
NFA81R10C222	5	Chip Feed-Thru Capacitor
NFA62R10C222	5	
NFA41R10C222	5	
NFM51R00P506	10	Chip Suppression Filter
NFM51R10P107	10	
NFM51R20P207	10	
NFM51R30P507	10	
NFM52R00P106	10	
NFM52R10P206	10	
NFM40R01C220	30	
NFM40R01C470	30	
NFM40R01C101	30	
NFM40R11C221	30	
NFM40R11C471	30	
NFM40R11C102	30	
NFM40R11C222	30	
NFM40R11C223	50	
NFM41P11C204	20	
NFM61R00T101	10	
NFM61R00T181	10	
NFM61R00T361	10	
NFM61R10T102	10	
NFM61R30T472	20	

muRata

INDUCTORS—CHIP

- Miniature Size
- Available in ferrite and ceramic cores
- Wide standard inductance range - 10nH to 2200μH
- High Q at frequencies to 100MHz for ferrite cores and to 1 GHz for ceramic core.

KIT-EKLQ015A

Part No.	Qty.	Type
LQN2A10NM04	50	1210 Chip Inductor
LQN2A18NM04	50	
LQN2A22NM04	50	
LQN2A33NM04	50	
LQN2A39NM04	50	
LQN2A47NM04	50	
LQN2A56NM04	50	
LQN2A68NM04	50	
LQN2A82NM04	50	
LQN2AR10K04	50	
LQN2AR12K04	50	
LQN2AR15K04	50	
LQN2AR18K04	50	
LQN2AR22K04	50	
LQH3NR10M92	40	1210 Chip Inductor
LQH3NR18M92	40	
LQH3NR27M92	40	
LQH3NR39M92	40	
LQH3NR56M92	40	
LQH3NR68M92	40	
LQH3NR82M92	40	
LQH3C1R0M04	30	1210 Chip Inductor
LQH3C2R2M04	30	
LQH3C4R7M04	30	
LQH3C100K04	30	
LQH3C220K04	30	
LQH3C470K04	30	
LQH3C101K04	30	
LQH3C221K04	30	
LQH3C331K04	30	

KIT-EKLQ016A

Part No.	Qty.	Type
LQP31A4N7J04	20	1206 Chip Inductor
LQP31A6N8J04	20	
LQP31A10NG04	20	
LQP31A15NG04	20	
LQP31A22NG04	20	
LQP31A33NG04	20	
LQP31A47NG04	20	
LQP31A68NG04	20	
LQP31AR10G04	20	
LQN1A8N8J04	20	1206 Chip Inductor
LQN1A15NJ04	20	
LQN1A17NJ04	20	
LQN1A23NJ04	20	
LQN1A27NJ04	20	
LQN1A33NJ04	20	
LQN1A39NJ04	20	
LQN1A47NJ04	20	
LQN1A56NJ04	20	
LQN1A64NJ04	20	
LQN1A84NJ04	20	
LQN1AR10J04	20	
LQH1NR15M04	20	1206 Chip Inductor
LQH1NR22M04	20	
LQH1NR33M04	20	
LQH1NR47M04	20	
LQH1NR56M04	20	

INDUCTORS—CHIP

★KIT-EKLQ016A *(continued)*

Part No.	Qty.	Type
LQH1NR68M04	20	1206 Chip Inductor
LQH1NR82M04	20	
LQH1N1R0M04	20	
LQH1N1R2M04	20	
LQH1N1R5K04	20	
LQH1CR12M04	20	1206 Chip Inductor
LQH1CR22M04	20	
LQH1CR47M04	20	
LQH1C1R0M04	20	
LQH1C2R2M04	20	
LQH1C4R7M04	20	
LQH1C100K04	20	
LQH1C22K04	20	
LQH1C470K04	20	
LQH1C101K04	20	

★KIT-EKLQ025A

Part No.	Qty.	Type
LQH3N1R0M04	30	1210 Chip Inductor
LQH3N1R2M04	30	
LQH3N1R5M04	30	
LQH3N1R8M04	30	
LQH3N2R2M04	30	
LQH3N2R7M04	30	
LQH3N3R3M04	30	
LQH3N3R9M04	30	
LQH3N4R7M04	30	
LQH3N5R6M04	30	
LQH3N6R8M04	30	
LQH3N8R2M04	30	
LQH3N100K04	30	
LQH3N120K04	30	
LQH3N150K04	30	
LQH3N180K04	30	
LQH3N220K04	30	
LQH3N270K04	30	
LQH3N330K04	30	
LQH3N390K04	30	
LQH3N470K04	30	
LQH3N560K04	30	
LQH3N680K04	30	
LQH3N820K04	30	
LQH3N101K04	30	
LQH3N121K04	30	
LQH3N151K04	30	
LQH3N181K04	30	
LQH3N221K04	30	
LQH3N271K04	30	
LQH3N331K04	30	
LQH4N391K04	20	1812 Chip Inductor
LQH4N471K04	20	
LQH4N561K04	20	
LQH4N681K04	20	
LQH4N821K04	20	
LQH4N102K04	20	
LQH4N122K04	20	
LQH4N152K04	20	
LQH4N182K04	20	
LQH4N222K04	20	

INDUCTORS—CHIP
(continued)

★ KIT-EKLQ025A *(continued)*

Part No.	Qty.	Type
LQH3C1R0M04	20	1210 Chip Inductor
LQH3C2R2M04	20	
LQH3C4R7M04	20	
LQH3C100K04	20	
LQH3C220K04	20	
LQH3C470K04	20	
LQH3C101K04	20	
LQH3C221K04	20	
LQH3C331K04	20	

★ KIT-EKLQ026A

Part No.	Qty.	Type
LQH1N1R0M04	20	1206 Chip Inductor
LQH1N1R2M04	20	
LQH1N1R5K04	20	
LQH1N1R8K04	20	
LQH1N2R2K04	20	
LQH1N2R7K04	20	
LQH1N3R3K04	20	
LQH1N3R9K04	20	
LQH1N4R7K04	20	
LQH1N5R6K04	20	
LQH1N6R8K04	20	
LQH1N8R2K04	20	
LQH1N100J04	20	
LQH1N120J04	20	
LQH1N150J04	20	
LQH1N180J04	20	
LQH1N220J04	20	
LQH1N270J04	20	
LQH1N330J04	20	
LQH1N390J04	20	
LQH1N470J04	20	
LQH1N560J04	20	
LQH1N680J04	20	
LQH1N820J04	20	
LQH1N101J04	20	
LQH1CR12M04	20	1206 Chip Inductor
LQH1CR22M04	20	
LQH1CR47M04	20	
LQH1C1R0M04	20	
LQH1C2R2M04	20	
LQH1C4R7M04	20	
LQH1C100K04	20	
LQH1C220K04	20	
LQH1C470K04	20	
LQH1C101K04	20	
LQH3C1R0M04	20	1210 Chip Inductor
LQH3C2R2M04	20	
LQH3C4R7M04	20	
LQH3C100K04	20	
LQH3C220K04	20	
LQH3C470K04	20	
LQH3C101K04	20	
LQH3C221K04	20	
LQH3C331K04	20	
LQM32C471M00	20	
LQM32C681M00	20	
LQM32C102M00	20	

★STANDARD DISTRIBUTOR ITEMS

POSISTORS FOR CIRCUIT PROTECTION

- For circuit protection
- Solid state ceramic
- Wide range of threshold currents
- For telecommunication, automotive, transformers, power supplies, transistors
- Replacement of fuses
- High reliability
- High and low voltage applications

KIT-PTHA-1

Part No.	QTY.	Res.	Max. V	Approx. Thresh Current (mA)
PTH POSISTOR, 5 each value				
PTH63G35AR0R5Q	5	0.45	30	1800
PTH622G35AR0R8H	5	0.8	30	1300
PTH623G35AR1R2H	5	1.2	30	950
PTH623G35AR1R8H	5	1.8	30	750
PTH61G35AR4R6H	5	4.6	30	470
PTH59G35AR130H	5	13	30	270
PTH63G35AR2R3H	5	2.3	80	820
PTH622G35AR3R7H	5	3.7	80	570
PTH623G35AR5R6H	5	5.6	80	500
PTH61G35AR9R4H	5	9.4	80	350
PTH60G35AR250H	5	25	80	200
PTH59G35AR550H	5	55	80	90
PTH63G37AR6R0H	5	6	265	550
PTH622G37AR100H	5	10	265	370
PTH623G37AR150H	5	15	265	30
PTH61G37AR250H	5	25	265	220
PTH60G37AR450H	5	45	265	145
PTH60G37AR650H	5	65	265	125
PTH60G37AR700H	5	70	265	120
PTH59G37AR151H	5	150	265	50
PTH63H01AR4R7M140*	5	4.7	140	620
PTH631H01AR5R6M140*	5	5.6	140	560
PTH622H01AR6R8M140*	5	6.8	140	430
PTH623H01AR100M140*	5	10	140	360
PTH624H01AR150M140*	5	15	140	280
PTH61H01AR220M140*	5	22	140	230
PTH60H01AR330M140*	5	33	140	160
PTH61G30BD2R2N	5	2.2	24	430
PTH61G30BD3R3N	5	3.3	24	350
PTH60G30BD4R7N	5	4.7	24	290
PTH60G30BD6R8N	5	6.8	24	240
PTH60G30BD100N	5	10	24	200
PTH60G30BD150N	5	15	32	150
PTH60G30BD220N	5	22	32	130
PTH60G30BD330N	5	33	32	110
PTH60G30BD680N	5	68	32	75
PTH60G30BD101N	5	100	32	65

*Indicates distributor standard UL listed component. Others available, please contact Murata Electronics.

★STANDARD DISTRIBUTOR ITEMS

POTENTIOMETERS— CHIP, TRIMMING

- Miniature size
- RVG4 Series, open frame
- Easily adjustable with regular screwdrivers
- Large, solid axle not affected by vacuum chuck during auto-placement
- Solder coated terminals eliminate solder leaching in reflow solder operations
- RVG4J and H Series available on 12mm tape and reel for auto placement
- RVG3A08 Series available for automatic adjustment
- RVG3A Series available on 8mm tape & reel for auto-placement

★ KIT-RVG3 BOX
(Open)

Part No.	Res.
RVG3A01, 20 each value	
RVG3A01-501VM	500 ohms
RVG3A01-102VM	1K
RVG3A01-302VM	3K
RVG3A01-502VM	5K
RVG3A01-103VM	10K
RVG3A01-203VM	20K
RVG3A01-303VM	30K
RVG3A01-503VM	50K
RVG3A01-104VM	100K
RVG3A01-204VM	200K
RVG3A01-105VM	1M
RVG3A08A, 20 each value	
RVG3A08-501VM	500 ohms
RVG3A08-102VM	1K
RVG3A08-302VM	3K
RVG3A08-502VM	5K
RVG3A08-103VM	10K
RVG3A08-203VM	20K
RVG3A08-303VM	30K
RVG3A08-503VM	50K
RVG3A08-104VM	100K
RVG3A08-204VM	200K
RVG3A08-105VM	1M

★ KIT-RVG4 BOX
(Open)

Part No.	Res.
RVG4J03, 20 each value	
RVG4J03-102VM	1K
RVG4J03-502VM	5K
RVG4J03-103VM	10K
RVG4J03-503VM	50K
RVG4J03-104VM	100K
RVG4J04, 20 each value	
RVG4J04-102VM	1K
RVG4J04-502VM	5K
RVG4J04-103VM	10K
RVG4J04-503VM	50K
RVG4J04-104VM	100K
RVG4H01, 20 each value	
RVG4H01-501VM	500 ohms
RVG4H01-102VM	1K
RVG4H01-302VM	3K
RVG4H01-502VM	5K
RVG4H01-103VM	10K
RVG4H01-203VM	20K
RVG4H01-303VM	30K
RVG4H01-503VM	50K
RVG4H01-104VM	100K
RVG4H01-504VM	500K
RVG4H01-105VM	1M

★ STANDARD DISTRIBUTOR ITEMS

THERMISTORS— SENSOR KIT

PTC AND NTC Thermistors for temperature sensing and compensation applications

- Small size
- Tight tolerance
- High reliability
- Surface mount applications
- Low cost series

KIT-SENS ①

Part No.	Res.(ohms)	Tol.	Sens. temp or Beta
SENS, 20 each value			
PTH9M04BE471TS2F333	470		90°C
PTH9M04BF471TS2F333	470		80°C
PTH9M04BD222TS2F333	2200		100°C
PTH9M04BB222TS2F333	2200		120°C
PTH59F04BE471TS	470		90°C
PTH59F04BC471TS	470		100°C
PTH9C22BD471Q-T	470	50%	95°C
NTH4G35A202F02	2000	1%	3500K
NTH4G39A103F02	10000	1%	3900K
NTH4G42B104F01	100000	1%	4250K
NTH5G40B333K01TE	33000	10%	4050K
NTH300XQ103E01	10000	3%	3650K
NTH300WC104E01	100000	3%	4100K
NTH5D333KA	33000	10%	4200K
NTH5D153KA	15000	10%	4100K

① Check catalog page for distributor standard part numbers.